

NATURE FABLES IN ENGLISH LITERATURE.

A Consideration of the Effect of Seven-
teenth Century Science - in particular
the Activities of the Royal Society -
on their Use.

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CHAPTER I.INTRODUCTION.

Nature fables have always been popular with British writers. In Anglo-Saxon times the phoenix, dragon, siren and such-like ancient creations were much used for allegory. After 1066 Mediterranean monsters like the centaur and hydra played an increasingly important rôle in English literature. Chaucer took a great many of his nature marvels from French sources, and used them in a very Gallic fashion. The Renaissance added new monsters from new lands, so that the Elizabethans had available well over a hundred flourishing nature fables usable in literature.

The new spirit of scientific inquiry, which ultimately tore apart practically the entire structure of mediaeval belief, had little difficulty in destroying faith in "unnatural natural history". It obliterated nearly all the old fables, and that in a very short period of time - of the large number of marvels and monsters generally credited in 1600, only a handful were left a hundred years later.

Of that handful, less than five are still believed today by the average not-too-well educated man.

However, there survived the attack of seventeenth century science a score of old fables which lost their bodies but not their spirits. Some of the oldest of the fabulous creatures, like the phoenix and dragon and mermaid and unicorn, seem actually to have benefited by their scientific destruction. Before 1600 they were regarded seriously, and thus their allegorical use was limited by physical considerations. After 1700, stripped of their bodies, they became symbols of extraordinary versatility. Today's poets would be in a bad way without their old faithful dragons. The myths which began long before the English language seem destined to travel along with it for a long time to come.

It is the purpose of this thesis to examine the origins and careers of the nature fables which have been useful to British writers from usually obscure beginnings through classic adornment, Christian absorption, Renaissance exploitation, sceptical disproof and Romantic revival to modern symbolic use. Particular attention will be paid to the period of scientific attack on the fables.

It has long been taken for granted that seventeenth century science destroyed most existing nature fables in this country: certainly it demolished nearly all the fables picturesque enough to be used by writers. This thesis will attempt to document that destruction.

To do this it will give especial consideration to the contra-fabulous spirit of seventeenth century England (Chapter V), and proceed to a detailed presentation of contra-fabulous investigations and discussions of the most scientific organization of the time, the Royal Society (Chapter VI).

It may come as a surprise to the reader to remark how often and how seriously this Society dedicated to the principle of Nullius in Verba devoted attention to nature fables whose existence depended on the opposite principle of Ullius in Verba. It is hoped that any possible sensation of depression induced by perusal of such a harsh attack on ancient and well-beloved myths will be more than compensated by feelings of pleasure at the realization that the myths which survived that attack have come down to us more flourishing and vigorous than ever.

CHAPTER II.

THE BEGINNINGS.

False beliefs about nature range as wide as nature herself, of course, and many of them, such as the large families involving sorcery and herb magic, defy close analysis or disproof. In this thesis, consideration will be given only to those fables which are non-magical, and which have been influential in English literature.

Such fables are old - older than history, indeed, since they began when men first managed to communicate their observations, guesses and wishes concerning the natural phenomena which gave and maintained life, pleased and terrified and killed them. The earliest beliefs probably began in magic, with personification of good and evil forces in nature,¹ and others

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1. "Imitative magic rests on the belief that like produces like. Primitive man acts.....the drama of the year, thinking to give fertility to his crops, flocks and herds. Hence arises ritual, and (later) dogma and mythology to explain it....." Sir William Dampier, A History of Science, p. xxvii. Dampier notes that Sir James Frazer "thinks that magic, religion and science form a sequence in that order," whereas "some anthropologists regard magic as leading directly to religion on one side and to science on the other....." Ibid.

owed their origin to other causes and combinations thereof: invention, pure and patchwork (phoenix, griffin); faulty observation (unicorn); misinterpretation (wart-producing power of toads); exaggeration (roc); explanatory guess (hibernation of swallows). Some may originate by bad reporting - a man who had never seen a sailboat might describe it as a "winged sea-monster". Some, as we shall see in the case of trochilus, came from mistranslation and/or literary license. Some Aesop-type fables may have been sophisticated inventions for painless instruction, and some were caused by simple confusion.¹ (It was once thought that certain fabulous beasts, such as unicorns and griffins, were brought into being by heraldry, the process of "dimidiation" or joining two coats of arms by marriage resulting in the front end of one animal being grafted on to the hind end of another, but this is not so. All of the notable patchwork beasts were there long before European heraldry began in the twelfth century. It has also been thought that gargoyles started monster myths,

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1. In the seventeenth century the Royal Society asked Sir Philberto Vernatti, seriously: "What ground there might be for that relation, concerning horns taking root, and growing about Goa?" Sir Philberto replied: "Inquiring about this, a friend laughed, and told me it was a jest put upon the Portuguese, because the women of Goa are counted much given to lechery." Thomas Sprat, A History of the Royal Society, p. 161. Date of inquiry not given.

as did the older stone carvings of Assyria and Egypt.¹ Perhaps - but such petrigenic monsters have proved of little literary durability.) Although, as Miall has noted concerning natural history,² the origins of "unnatural history", or nature fables, can hardly ever be fixed even approximately,³ we can be reasonably sure that most of those which came down to medieval England originated in pre-history in one or more of these ways, and we can be quite sure that, however originated, they clung to life with fierce tenacity. "For lewed people loven tales olde," as Chaucer said,⁴ and tales about plants and animals and men were the best-loved tales of all.

They appear in the earliest literature. A Babylonian story, "The Borrowed Plumes", which is more than four thousand years old, speaks of traditional enmity between a phoenix-like bird and a monstrous serpent.⁵ Homer passes on the old story about the war of

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1. Vide the chapter on "The Dragon of the Ishtar Gate" in Willy Ley, The Lungfish, the Dodo, and the Unicorn.
 2. "The beginnings of natural history are wholly unknown to us." I.C.Miall, The Early Naturalists, p. 1.
 3. Noteworthy exception: the footlessness of the bird of paradise, q.v.infra.
 4. Prologue to "The Pardoner's Tale", l. 437.
 5. Gaster, The Oldest Stories in the World, p. 80.

cranes and pygmies. The Bible contains references to giants, dragons, unicorns, sea and land monsters, cockatrices, hybrids, fiery serpents, Leviathan and Behemoth and a host of brutes possessing human emotion and super-human and supernatural powers.¹ Few primitive religions and literatures are without elements of nature fable, and most of the old myths survived to reach Greece and Rome. It is now proposed to trace briefly the course by which nature fables, included in general natural history lore, descended from classic sources to medieval Europe.

The first significant figure in the literature is Herodotus, often called the "father of history", who was also god-father of natural, and unnatural, history. He exercised better judgment than most of his

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1. Recent scholarship has determined that many apparently mythical Bible beasts may not originally have been so. Particularly do Biblical "dragons" and "unicorns" seem to have been the result of misinterpretation. (See discussion of these creatures below.) But it was the Bible so misinterpreted that most influenced English literature - consider the effect of such sacred dicta as "There were giants in the earth in those days," (Gen. 6: 4) and "Thou shalt not suffer a witch to live," (Ex. 22: 18) and "Jonah was in the belly of the fish....." (Jonah 1: 17). And many Biblical wonders were not misinterpretations, e.g. the magic powers of Aaron's rod; Balaam's talking ass and so on.

classic successors when he collected stories from Asia and Egypt as well as Greece; although he spoke respectfully of griffins and gold-mining ants bigger than foxes he would not guarantee the existence of werewolves or the phoenix. He usually had to see to believe. Herodotus' successor was Ctesias, a less critical Greek author-physician of the court of Artaxerxes, many of whose "strange and incredible accounts", according to Sir Thomas Browne, were revived 1700 years later by "our countryman, Sir John Mandevil, Knight".¹ The next important writer was Aristotle. He was "the first and in many ways the greatest of all naturalists,"² but his enormous ability and prestige did not make any the less unnatural several of his natural history pronouncements. He said that eels have no sex, that bees are generated by their "kings", that blinded swallows can recover their sight, that there may be "fire-creatures" on the moon, that the ash-coloured bittern during sex union drips blood from its eyes, and among other fables he subscribed to the primitive theory of spontaneous generation, thus helping to preserve the life of this myth for another two thousand years. Aristotle was

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1. Browne, Pseudodoxia Epidemica, part I, sec. 8, mem. 2.
 2. Singer, The Story of Living Things, p. 22.

succeeded by the earnest botanist and "character" writer Theophrastus (d. 287 B.C.), "a man of comprehensive attainment" ¹ and some importance as a natural, and unnatural, historian, but after Theophrastus scientific investigation declined. Nicander (fl. 120 B.C.) concerned himself mainly with what Browne called "traditions and popular conceits" about snakes, ² Strabo (fl. 20 A.D.) managed some natural history that was less accurate than his geography, and Dioscorides, a surgeon attached to Nero's army, industriously listed many facts and myths concerning medicinal plants. Contemporary with Strabo and Dioscorides was the most important of all classic nature fable gatherers, Pliny.

Gaius Plinius Secundus, "Pliny the Elder", was the funnel through which the nature myths of classic time, gathered from Asiatic, Egyptian and Hellenic sources, poured north into medieval Europe. His Naturalis Historia exerted enormous influence throughout the Middle Ages.

Pliny kept alive.....the ancient tradition
which otherwise would have lacked the supreme

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1. Taylor, The Mediaeval Mind, Vol. I, p. 6.
 2. Browne, op. cit., part I, sec. 8, mem. 9. Nicander also added wings to Herodotus' gold-mining ants, of which more later.

coherent account..... The importance of such a document during the Middle Ages was incalculable Unlike most old manuscripts that of Pliny was never lost during the darkest days..... This was due largely to its popularity - one might almost say its modernness - in those distracted times..... 1

The Naturalis is a vast compilation dealing with agriculture, astronomy, chemistry, geography, geology, history, industry, medicine and a score of other subjects - indeed, as Pliny's nephew Pliny the Younger stated, it is an opus "diffusum, eruditum nec minus varium quam ipsa natura" ² - but its main emphasis is on natural history, and it was on this subject that it had its greatest effect. And, since much if not most of his natural history is fabulous, most of that effect for England was to provide its literature with "a string of marvels that the world has never seen equalled".³ From Anglo-Saxon beginnings⁴ to the eighteenth century Pliny was the main source of natural history fact - and fancy - for British writers. What was not taken from him directly was usually taken from his

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1. Wethered, The Mind of the Ancient World, passim.
 2. Pliny, Epp. iiii, 5.
 3. Adams, Travellers' Tales, p. 63.
 4. Leechdoms, Wortcunning, and Starcraft of Early England, ed. by the Rev. Oswald Cockayne, Vol. II, p. 155, refers to "Plinius, the mickle Leech," and is everywhere replete with Plinian "remedies" and herb magic.

successors and inheritors.

First of the major successors of the gentleman of Verona were Oppian (fl. 150 A.D.), and Solinus (fl. 275 A.D.), who was but a condensation of Pliny, and Solinus' contemporary, Aelian, whose "gossipy work" on animals was "perhaps the most unsystematic treatise ever written on natural history".¹ After Solinus and Aelian the so-called Dark Ages descended, and for centuries the myths depended mainly for their survival on the Church fathers, who forgot many but retained some for exegesis.² And in those early years the old Plinian store of fables was increased by others found in that odd little work of fancy called the Physiologus, a group of stories about animals collected in the second century or earlier, perhaps in Egypt. In the twelfth century the Physiologus was expanded into the tremen-

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1. Robin, Animal Lore in English Literature, p. 10. Browne said (op. cit., part I, sec. 8, mem. 6) that Aelian was "an elegant and miscellaneous author," but responsible for "many things suspicious, not a few false, some impossible".
 2. ".....the eyes of the Fathers were closed to the natural world, or at least their vision was affected with an obliquity parallel to the needs of doctrine. Any veritable physical or natural knowledge rapidly dwindled among them. What remained continued to exist because explanatory of Scripture and illustrative of spiritual allegories..... It is safe to say that neither Ambrose nor Jerome nor Augustine had any clearer understanding of such things than Pliny. They had read far less about them and knew less than he." Taylor, op. cit., Vol. I, p. 75.

dously popular bestiaries, books designed to teach theology by analogy.¹ In the fifth, sixth and seventh centuries flourished the "Encyclopedists", Martianus Capella, Cassiodorus and the great Bishop Isidore of Seville, who turned out large tomes of nature facts and fables, but the first noteworthy English natural historian did not appear until the twelfth century.² He was Alexander Neckham. Most of his De Naturis Rerum was derived from the Polyhistor of Solinus, and so, as one might expect, passed on the standard stories of two-headed serpents, basilisks, dragons, griffins, the phoenix and so on. It is notable that after eleven centuries, while most of the literarily significant fables had survived, many of the less picturesque had perished, to be replaced by only a few non-Plinian alternatives. Neckham, for instance, remarked that cuckoo-spit breeds grasshoppers, a circumstance which

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1. A second type of "natural history guide" was the herbal. Such botanical treatises first appeared in, approximately, the sixth century. Their information was supposed to derive from Chiron, master of Achilles, by way of Aesculapius. A third type of natural history book was the lapidary, a treatise on stones, which was usually in poor verse and is of no importance to this thesis.
 2. Early English writers such as Bede and Alfred who touched on natural history but were not of prime importance in that field will be discussed later as literary figures.

had escaped the notice of Pliny.¹ Contemporary with him was the less important Giraldus Cambrensis,² who showed a taste for the quaint in his fabling: he mentioned a fish with three golden teeth that was not often found in other collections of natural history. The next century produced the three great Dominicans (none of them English, but all influential in England): Thomas of Cantimpre, Vincent of Beauvais and Albertus Magnus - and also Roger Bacon. The work of Albertus on plants, although Browne warned that one must "receive it with caution",³ has been termed by Singer perhaps the best work on natural history in the Middle Ages.⁴ Roger Bacon branded false many Plinian fables, but was not guiltless of gullibility here and there.⁵ Also produced in the thirteenth century was the De Proprietatibus Rerum of Bartholomaeus Angelicus, "Friar Bartholo-

1. "Cuculorum salivae cicadas gignunt." Neckham, De Naturis Rerum, Cap. lxxii.
2. Although not of the first rank as a natural historian, Giraldus was a notable figure of the century, and his own conception of himself "as the last of the humanists is very nearly justified". Helen Waddell, The Wandering Scholars, p. 154.
3. Browne, op. cit., part I, sec. 8, mem. 12.
4. Singer, op. cit., p. 74.
5. He said, for instance, that a potion made of gold, pearl, flower of sea dew, flesh of Aethiopian dragon and other bizarre ingredients might "prolong longevity to an extent hitherto unimagined". The "Opus Majus" of Roger Bacon, ed. by J.H. Bridges, Vol. I, clii.

mew", most authoritative English natural history book until the Renaissance. Singer says De Proprietatibus was "perhaps the most widely read scientific work of the middle ages".¹ In the fourteenth century the travellers' tales of Marco Polo, Odoric and Mandeville increased the supply of nature fables, and the advent of printing soon after helped to spread the stories, old as well as new.

It was in the sixteenth century, however, that nature fables reached their peak of abundance and popularity in England. The Renaissance spirit lusted after marvels; scholars ransacked the classic sources,² world-voyagers brought back fresh wonders from far countries, and the new printing presses were kept busy turning out large compendia of natural history.³ Outstanding among the many European writers in the field in this period were Conrad Gesner, Belon, Bauhin, Aldrovandus, Maplet, Caius, Turner, and John Gerard. These men, with the possible exception of the notable plagiar-

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1. Singer, op. cit., p. 38.
 2. Greek texts, lost to the West since the fall of Rome, became available to European scholars after the fall of Byzantium in 1453.
 3. Very popular in England from 1586 to 1686 were the "emblem books", collections of highly symbolic pictures with explanatory text, which made use of many nature fables.

ist Gerard,¹ were much more sceptical and observant than their medieval predecessors, but none of their works were free of nature fable.

These, then, were the individuals who, beginning with Herodotus, were most influential in collecting and passing on the great body of nature fables from antiquity to Elizabethan England, the men who might be called natural historians.²

It is now necessary to list the fables themselves. Not all of them, of course - such a task would be hopeless, since there are thousands of "basic" fables, and many more thousands of "specialized" ones in each locality, and all of them are constantly changing shape. In the next chapter will be found a list, alphabetically arranged, confined to the nature fables which have been most influential in English literature.

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1. Gerard was such a pilferer of others' works, even in that age of general pilfering, that Raven calls him "a rogue.....moreover, botanically speakinga comparatively ignorant rogue." Raven, English Naturalists from Neckham to Ray, p. 211.
 2. It was not until after 1700 that "scientific" books came to be considered as separate from other books.

CHAPTER III.

THE FABLES.

In the following catalogue of nature fables it will be noticed that not everything is fabulous. There are stories wholly or partly true. Such stories are included when from them, by exaggeration or confusion or other agency, fables have arisen.

It is not possible here to trace in detail the course of such stories in their progress from truth to fiction: there can only be an indication of origins, an amassing of some of the raw material of nature fact as well as fancy from which came, ultimately, fables used in literature.

AMAZON.

The Amazons were strictly mythical warrior-women who lived without men and only occasionally had intercourse with neighbouring nations. When they bore sons they killed them or sent them back to their fathers; when they bore daughters they reared them as warriors, burning off their right

breast to allow easier handling of the bow.¹ Earliest legend placed them on the south shore of the Euxine, but later, as Herodotus reported, they were conquered by the Greeks and some were taken away on ships. They revolted on the ships, killed all the Greeks aboard, and - since they knew no navigation - drifted to Cremni (near Taganrog?) in Scythia. There they stole horses until the Scythians fought them, discovered them to be women, and befriended them. The Amazons could not stomach the Scythian women, however, and so went across the Don, whither the Scythian men followed them, and must have reduced themselves to the status of drones, because, as Herodotus concluded, the Amazons returned to their old ways of living. Indeed, they seem to have become respectable citizens, with only one anti-social custom: the qualification for a young lady's presentation at the Amazon court consisted of her having killed a man, and until she was so qualified she could not marry. In the Middle Ages they were regarded as real persons. Sir Walter Raleigh in his account of his voyage to Guiana in 1595 spoke of hearing reports

1. In Greek "amazoness" means "breastless".

of Amazons in the New World, along with headless people ¹ and cannibals. In literature the Amazons have always been popular as typifying self-sufficient and ferocious females.

AMBER.

Amber is fossil resin, mostly from a pine-like forest that grew in East Prussia in the Oligocene period. Its origin puzzled people for thousands of years; it was thought to be bitumen, lynx urine, excrement of the sea or sweat of the sun, petrified sperm of dolphins, the product of ants, or various other things, including the sap of trees. The Greeks called it "elektron" ² and gave it a lovely origin. As Ovid tells the story, in Metamorphoses, II, the Heliades, sisters of Phaethon, were turned into trees as they wept at his sepulchre, and

.....still their tears flow on, and these
tears, hardened into amber by the sun, drop

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1. People whose heads grew beneath their shoulders, to be exact. For discussion of these Plinian creatures, see "Wild Men" below.
 2. In the seventeenth century William Gilbert examined the forces developed when certain bodies such as amber are rubbed, and coined the word "electricity" from "elektron".

down from the new-made trees. The clear river receives them and bears them onward, one day to be worn by the brides of Rome.

Pliny scoffed at this story, calling it one of the "lowd lies" of the Greeks. He went on to report that "Sophocles the Tragicall Poet" had declared that amber was tears of the birds called Meleagrides, "beyond India.....wailing and weeping for the death of Meleager," and he scoffed at that story too:

For what child is there.....so simple and ignorant, who will beleeve, that birds should depart as farre as to the Indians and beyond, for to mourn and lament the death of Meleager, when he died in Greece?

Pliny rejected the other current theories concerning amber origin and concluded:

But to.....speake resolutely and with knowledge, of Amber: knowne it is for certain, That engendered it is in certaine Islands of the Ocean Septentrionall.....in certain trees, resembling Pines in some sort, and issueth forth from the marrow of them, like a gum in Cherrie trees, and rosin in Pines. 1

Amber was highly esteemed in classic times and during the Middle Ages. It was the only gem mention-

1. Pliny, Natural History, II, 605, 607.

ed by Homer, and The Romance of the Rose (II, 19857 f.) declared that man has not "one single quality or member/ More precious than a lump of amber....." But despite Pliny's dictum ignorance concerning its origin continued long after his death. Basil called it the crystallized sap of plants, but Agricola and Paracelsus said it was mineral, and disagreement persisted until well into the eighteenth century. Indeed, it still does; there may be found persons today who believe amber to be a mineral, or a sea-product, or whatnot fabulous, just as there may be found persons who still believe in spontaneous generation, "tarantism" and a host of other supposedly thoroughly disproved fables.

AMBERGRIS.

Ambergris is a waxy, aromatic substance secreted by the liver or intestines of whales and usually found floating on tropic seas. It was originally called "amber", from the French word "ambre" but when the fossil resin came to be called "ambre jaune" this substance became known as "ambre gris". The two "ambers" were confused until the

seventeenth century. Ambergris is used in perfumery, and has from earliest times been fabulously valuable. It was mentioned in the "Arabian Nights" tales. Bartholomaeus Anglicus speculated on the possibility of its being whale sperm, but probably not until the middle of the seventeenth century was its real origin suspected.

AMPHISBAENA.

This was a fabulous serpent, supposed to have two heads "as it were, that is to say, one at the taile, as if she were not hurtfull ynough to cast her poison at one mouth only".¹

ANT.

Long before Solomon's time ants were regarded as most frugal and industrious creatures, and our literature has always been replete with references to them as symbols of those virtues. Augustine thus described "the Christian ant":

What is this? See the ant of God, he riseth day by day, he hasteneth to the Church

1. Pliny, ibid., l. 208.

of God, he prayeth, he heareth lection, he
chanteth hymn, he digesteth that which he
hath heard, with himself he thinketh there-
on, he storeth within grains gathered from
the threshing-floor. 1

Alas, it seems that these supposedly most fore-
sighted of animals are not necessarily so - the
European ones, anyway! In the eighteenth century
the French naturalist Réaumur stated that French
and English ants do not enjoy in winter the fruits
of their summer's labour, because in winter they
are so tightly crowded together, for warmth, that
they can hardly move. Furthermore, recent in-
vestigation indicates that European ants are prac-
tically entirely carnivorous - the small white
grains which they are seen to carry are not seeds,
but pupae. And so, as R.H. Newell has expressed it
in his Zoology of the English Poets:

Our poets, drawing their information
from.....fabulous sources, or sheltering
themselves under classical authority, have
followed each other in the self-same track
of error, and by the introduction of these
faults have disfigured many of their beau-
tiful descriptions and illustrations of

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1. Augustine, Expositions on the Book of Psalms,
III, 300.

industry, sagacity, and foresight.¹

Ants have also been credited with other virtues, vices and unusual practices. Herodotus spoke of ants bigger than foxes that mined gold; Pliny elaborated on this story:

In the countrey of the Northerne Indians named Dardas, the Ants doe cast up gold above ground from out of the holes and mines within the earth; these are in colour like to cats, and as big as the wolves of Aegypt. This gold beforesaid which they worke up in the winter time, the Indians do steale from them in the extreame heat of Summer, waiting their opportunitie, when the Pismires lie close within their caves under the ground, from the parching Sun; yet not without great daunger. For if they happen to wind them and catch their sent, out they goe, and follow after them in great hast: and with such furie they flie upon them, that oftentimes they teare them in peeces; let them make way as fast as they can upon their most swift Camels, yet they are not able to save them. So fleet of pace, so fierce of

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1. Newell, Zoology of the English Poets, pp. 3 f. Newell, writing in 1845, declared: "The Poets are early read, and hence the erroneous notions imbibed from them are deeply fixed, and long retained..... False representations of natural objects can never be necessary: the beautiful features of Nature are inexhaustible, and a faithful delineation of them is capable of being set off by the hand of Genius and Taste with all the graces of poetry..... Ibid., p. vii. He admitted, however, that it is possible that ants of warmer climates may possess the fabled foresight and industry, and that Solomon's command to the sluggard may have had reference to such agriculturalists.

courage are they, to recover gold that they love so well. 1

Pliny said also that ants only work at the full of the moon; that they like fish and are disliked by mice and rats; that they are repelled by powdered brick in water, bat hearts and the double livers of frogs; that they are killed by the smell of brimstone, origan or quicklime, and that "of all living creatures, they onely and men, doe enterre and burie their dead among them".² Some of these beliefs, and others as odd, still persist.

ANTIPATHIES AND SYMPATHIES.

Attribution of irrational loves and hates between animals and plants probably began with the most primitive sympathetic magic. Empedocles projected human emotion into the universe and declared that the world was ruled by love and strife. Ancient astrologers said the stars saw and heard each

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1. Pliny, op. cit., 1, 329. It has been suggested that perhaps these "ants" were marmots, which are not as big as wolves but do dig in Indian sand. For further discussion of gold-mining ants, see "Griffin".
 2. Ibid., 328.

other, and were affected by love and hate,¹ and so all things of earth, being subject to the stars, were similarly affected. By Pliny's time the list of such supposed antipathies and sympathies was almost interminable, including nearly everything from dragons (which despise elephants) down to vines, which hate radishes so much that they will "wryth and turne away sensibly from them".² As time went on the list grew longer. Mediaeval books of magic consisted largely of monumental catalogues of such affinities and dislikes. Writers have always used them. Seventeenth century science began to prune the list - Willughby in his Ornithology called the supposed antipathy between trochilus and eagle "an Old Wives Fable"³ - but many such "instinctive" antipathies and sympathies are still believed in⁴ - and used by writers.

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1. Cancer and Aquarius, being both aquatic, love each other; Leo hates Capricorn; the Twins hate the Ram; the Ram loves the Bull, and wages war against the Virgin, and so forth.
 2. Ibid., II, 17. Vines die of hate of colewort. Eagle hates wren, or "trochilus", oak hates olive, fig loves rue, and so forth.
 3. Willughby, Ornithology, p. 228.
 4. United States zoo-keepers say zoo elephants do not fear zoo mice.

BARNACLE GOOSE.

Grouped under this head are many legends about unnatural origin of various birds, usually of the goose kind. Edward Heron-Allen in his book Barnacles in Nature and in Myth lists sixty-six names of birds supposed to have been bred of leaves and fruits of trees, seaweeds, driftwood, fungi, water, shellfish and other materials, in or around Scotland, Ireland, Iceland and the river Thames. Many of the names, such as "branta, bernicla, bernichias, barliata" and so on, resemble "barnacles", but many, such as "clakis, baum-gens, rot-gens, crabran, diable de mer, judelle, macreuse, oye nonette, pie annet, canard," do not. All, however, concern vegetable or tree or water-born birds like geese. Among probable causes of these myths were the fact that certain geese breed so far north that their nests and chicks were not observed until Renaissance times and the fact that certain shell-fish closely resemble tiny geese. Confusion of words also helped - there is a goose called a "barnacle", the name derived from "branclakis" or "dark goose", and a shellfish called "barnacle", a

word derived from the Latin "pernacula", or "small ham", which it resembles. Heron-Allen believes the shellfish-origin theory may be as old as Troy, observing that archaeologists "seem to be agreedthat the earliest colonists of Mycenae came from Troy", quoting Sir Ray Lankester:

.....it seems that they (the people of the Mycenaean period) observed and drew the Barnacle (shellfish) floating on timber or thrown up after a storm..... They detected a resemblance in the marking of the shells to the plumage of a goose, whilst in the curvature of its stalk they saw a resemblance to the long neck of the bird. The Barnacle's jointed plumose legs..... and other details suggested points of agreement with the feathers of the bird.....

and pointing out that pictures on Mycenaean pottery look like what he calls "barnaculized" geese.¹ Robin doubts such prehistoric Aegean origin of the myth, however, on the ground that there is no mention of a barnacle goose in classic literature, and concludes:

As far as Western Europe is concerned, the idea seems to have originated in the north-west, as the localities assigned to these geese were the Orcades (Orkneys), Scotland, and Iceland.... Earliest allusion to the barnacle goose perhaps occurs

1. Heron-Allen, Barnacles in Nature and in Myth, passim.

in an Old English riddle contained in the Exeter Book, and probably written before A.D. 750. 1

Whatever its origin, the barnacle goose was a favourite subject for speculation and literary allusion for centuries. Giraldus Cambrensis wrote:

There are likewise here (in Ireland) many birds called barnacles, which nature produces in a wonderful manner, out of her ordinary course. They resemble the marsh-geese, but are smaller. Being at first gummy excrescences from pine-beams floating on the waters, and then enclosed in shells to secure their free growth, they hang by their beaks, like seaweeds attached to the timber. Being in process of time well covered with feathers, they either fall into the water or take their flight in the free air, their nourishment and growth being supplied.....from the juices of the wood in the sea-water. I have often seen with my own eyes more than a thousand minute embryos of birds of this species on the seashore, hanging from one piece of timber, covered with shells, and already formed. No eggs are laid by these birds after copulation.....in no corner of the world are they seen either to pair, or to build nests. Hence, in some parts of Ireland, bishops and men of religion make no scruple of eating these birds on fasting days, as not being flesh, because they are not born of flesh.

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1. Robin, Animal Lore in English Literature, pp. 32 f. The riddle: "And beneath the waves I lived;/ in the wandering billows) in the sea I waxed/ clinging with my body/ when I from the clasping came/ in my black array;/ my pranked garments fair,/ me a living creature,/ and as wide as far/ Say, what is my name?"

But these men are curiously drawn into error. For, if any one had eaten part of the thigh of our first parent, which was really flesh, although not born of flesh, I should think him not guiltless of having eaten flesh. 1

In 1435 Aeneas Sylvius Piccolomini, afterwards Pope Pius II, visited James I of Scotland and "made diligent inquiry for this goose-bearing tree of which he had heard accounts," and when he was told that it grew farther north, complained that "miracles flee further and further".² In 1499 Polydore Vergil angrily dismissed the barnacle goose myth as fabulous, but sixteenth century literature is full of references to it, and not until the end of the century was there observational evidence to disprove it. William Barents reported that on his third voyage, on June 21, 1596, between Spitsbergen and Norway there were found "many red geese eggs" and geese

.....of a perfit red colour such as come into Holland.....but till this time it was never known where they hatched their eggs, so that some men have taken it upon them to write that they sit upon trees in Scotland, that hang

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1. Giraldus Cambrensis, The Historical Works, p. 36. "Giraldus" says T.H.White in his Book of Beasts, p. 268, "like St. Jerome, was fond of the theory that the Irish were cannibals in any case".
 2. Cited by Heron-Allen, op. cit., p. 20.

over the water, and such eggs as fall from
 them down into the water become young geese
but this is now found to be contrary
 1

Willughby also called the legend false, but the old myth lingered on - until the end of the eighteenth century European herbals still listed the goose-hatching tree. Heron-Allen states that the story was also popular in France, and when it was finally discredited gave to the French language the expression "un canard". The Oxford Dictionary, however, does not list the barnacle goose among the possible sources for that usage of "canard".

BASILISK

The basilisk, or cockatrice, was the king of serpents. (In Greek "basileus" means king.) It was thought to be born of a cock's egg hatched by a toad, and it had a cock's head and a reptile's body. Usually it wore a small golden crown. It could kill by simply looking at its victim - although some legends maintained that if a man saw it before it saw him, then the basilisk died.

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1. Purchas His Pilgrims, cited in Elizabethan Verse and Prose, p. 467.

It could also be overpowered by looking at it through a crystal vase, or by setting a weasel on it. In mediaeval times it was sometimes credited with great beauty, and it was regarded as a symbol of Satan. Said Augustine, commenting on Psalm 91: 13:

Thou shalt go upon the asp and basilisk;
the lion and the dragon shalt thou tread under
thy feet:

The lion openly rages, the dragon lies
secretly in covert: the devil hath each of
these forces and powers.....the basilisk is
the King of serpents, as the devil is the
king of wicked spirits..... 1

The Hortus Sanitatis said that the basilisk "sleeth with his crye aswell as with his sight....." ² In later ages the word "cockatrice" passed into slang - John Ray noted that in the seventeenth century it had come to mean not only the fabulous serpent, but a "wagtail.....leman.....kind-hearted soul", or "one of us" - a whore. ³

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1. Augustine, op. cit., IV, 310. The King James version translates this verse: "Thou shalt tread upon the lion and adder....." On several occasions the King James version speaks of cockatrices.
 2. Hortus Sanitatis, p. 88. Hortus also described the basilisk as a "regulus", with the ordinary basilisk attributes plus "wynges". Ibid. p. 68.
 3. Ray, A Handbook of Proverbs, p. 64.

BAT.

Pliny said that bats were the only birds that had teeth and gave milk, and he credited them with all manner of magic powers. Basil commended them for their gregariousness:

What natural love bats have for each other! How they interlace like a chain and hang the one upon the other! A very rare spectacle among men, who for the greater part prefer individual and private life to the union of common life. 1

The Bestiary called the bat "paltry" and "undistinguished",² but weird beliefs continued to cluster about the little creatures as closely as they cluster about themselves. It has been thought that Satan took their form and that souls flew around as bats in the evening, that bats fly at night to avoid creditors, and that their heads hang down because their brains are so heavy. There have also been many exaggerated vampire-bat stories. In the tropics there are large fruit bats which bite animals, including human beings, usually on the toes, and lap the blood, but loss of blood through such a

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1. Basil, Letters and Select Works, p. 99.
 2. White, op. cit., pp. 140 f. The Book of Beasts is a translation of a twelfth-century Bestiary.

small hole would not be great. In The Pictorial Museum of Animated Nature, a not too accurate publication of 1843-5, the following typically magnified account of such bats' operation is given by an unidentified "Captain Stedman", who stated that he had been "thus bitten":

Knowing, by instinct, that the person they intend to attack is in a sound slumber, they generally alight near the feet, where, while the creature continues fanning with its enormous wings, which keeps one cool, he bites a piece out of the tip of the great toe, so very small, indeed, that the head of a pin could be scarcely received into the wound, which is consequently not painful; yet through this orifice he continues to suck the blood until he is obliged to disgorge. He then begins again, and thus continues sucking and disgorging till he is scarce able to fly; and the sufferer has often been known to sleep from time into eternity. 1

Bartholomew passed on the old fable that bats are blind, and Albertus Magnus gave the corresponding sympathetic-magic recipe: if you want to see better, rub your face with bat blood. The Hortus Sanitatis described the "backe" or "vespertilio" thus:

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1. The Pictorial Museum, I, 3. The Encyclopaedia Britannica makes no mention of any "sufferer" of vampire-bat bite dying from loss of blood.

.....a bird with foure fete.....mouth & tethe
 lyke a mowse and no tayle.....no fethers.....
 winges on the which be no fethers but thin
 skinned facioned lyke a dragons winge.....it
 bringeth forth her yonges lyke a beste with
 iiii. fete and it layth none egges. The
 blode of it is good to be enoynted upon
 maydens brestes for that they shall not waxe
 very grete..... Ther be in Ynde some as moche
 as doves and they fle by evyn tide. they
 have tethe like a man. and these be so bolde
 whan thei flie that they festen in the face of
 a man and byte the nose or eres and shend a
 mannes visage. 1

BEAN.

Beans were regarded with awe by the ancients. The Roman Flamen Dialis was not allowed to touch or even name them. Pliny said that they housed dead souls, and caused dreams. Their rapid growth rate was exaggerated, by others as well as by the Giant's Jack² and they were credited with various magical powers. Bartholomew said they caused vain and dreadful dreams, and Gerard said they could be used to prevent growth of hair.

BEAR.

There were two main fables about bears,

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1. Op. cit., p. 124.
 2. "There ain't but phew things that can beat a bean climbing a pole." - Josh Billings.

both very old. It was thought that their cubs were born unformed, and had to be licked into shape by the mothers, and that hibernating bears derived nourishment from sucking their paws. Aristotle said bear cubs were born hairless and with no joints in their legs. Pliny passed on both the formless-cub and nutritious-paw stories, and added that lion and fox cubs were also born shapeless. He also declared that bears cured themselves of food poisoning by eating ants, and healed dimness of sight by having bees sting them; that their fat was good for baldness, that their breath was deadly, that their heads were softest of all animals (parrots having the hardest), and that in their brains was a kind of venom. In the Middle Ages it was thought that bears went mad after eating mandrake and then cured themselves by devouring ants. Laplanders used to call bears the dogs of God, and in Norway there is an old proverb giving the bear the strength of ten men and the wisdom of twelve. In Norman church architecture the bear seems to have been used as a symbol of the devil.¹ Basil said

1. Arthur H. Collins in Symbolism of Animals and Birds Represented in English Church Architecture, p. 33, writes that on the south door of the Norman church at Barfreston there is a bear playing a harp - probably luring his victims by "sensual delights".

that wounded bears cure themselves by eating mullein, which was about what Pliny had said. The Hortus Sanitatis described "Ursus the bere" as a "fell beste.....of evyll shape" that in winter

.....layth still sucking of his fote wherof he waxeth so wonders fatt that he can nat almost go and the beres take eche other in their armes or leges like men and women & slepe all the first fortnight.....beris fleshe islymy & evyll to be etyn, but it is gode for medecynes, the fattest is best, & his grece doth cause here to growe. 1

Sir Thomas Browne declared that the story of bear cubs being born shapeless was "repugnant unto the sense of every one that shall with diligence enquire into it", stating that Mathiolus, Julius Scaliger and Aldrovandus had so "enquired" and found that the cubs were "perfectly formed, and compleat in every part". Furthermore, he said

It is.....injurious unto reason, and much impugneth the course and providence of nature, to conceive a birth should be ordained before there is a formation. 2

Needless to say, the shapeless-cub myth, and all the other bear myths, lingered on in the popular mind long after the savants had discarded them.

1. Op. cit., p. 76.
2. Browne, Pseudodoxia Epidemica, p. 116.

BEAVER.

It was thought that beaver testicles contained "castoreum", a medicinal substance which calmed stormy waters and sank whales; that beavers, pursued for their testicles, bit them off;¹ that their tails, being, as De Proprietatibus Rerum phrased it, of fishy kind, would rot if kept out of water. (Cf. Romeo and Juliet, Act III, scene 4: "O flesh, flesh, how art thou fishified!") After 1492 beaver habits were credited to the beaver-like but smaller New World muskrat, or musquash, which was said to castrate itself when pursued for its testicles which contained musk. Alexander Neckham denied the truth of the castration story, but Giraldus vouched for it and elaborated:

When the beaver finds he cannot save himself.....that he may ransom his body by the sacrifice of a part, he throws away that, which by natural instinct he knows to be the object sought for.....and if by chance the dogs should chase an animal.....previously castrated, he has the sagacity to run to an elevated spot, and there lifting up his leg,

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1. Beaver in Latin is "castor", and White's Book of Beasts, p. 29, said that "the creature is called a Beaver (Castor) because of the castration" - a more than ordinarily plausible example of mediaeval pseudo-etymology.

shews the hunter that the object of his pursuit is gone. 1

The Hortus Sanitatis stated that since beaver tail "is of nature like a fishe, in some places cristen peple ete it in ye lente", and continued:

The wyse maisters wryte yt the Bevers gether them together in a gret company & go to the forest & hewe downe moche wode with their tethe, & than amonge them they chose out one & cast him on his backe & betweene his foure fete they lay asmoche wode as they can drawe with him away, & of this wode they bylde their holes or dennes very strongly, & this wronge they do to none but to them that for age have so blont tethe that they can hewe no wode, or ellis to one that is of late come straungely to their company, and of him they make their carte, the hunters that hunt them knowe them wel that have drawen the carte, for they have but lytell here an their backe, & therfore they let them go oftentymes agayne..... 2

It is now known that beavers do secrete a bitter substance, still called castoreum, which is used in medicine as a stimulant and anti-spasmodic, but it is found in two special sacs, not in the testicles. And they do not castrate themselves, nor do their tails rot in air.

1. Giraldus, op. cit., p. 431.
2. Op. cit., p. 31. Pliny credited this cart-trick to marmots: ".....when the male or female is loden with grasse and hearbs.....it lieth upon the backe.....and then commeth the other, and taketh hold by the taile with the mouth, and draweth the fellow into the earth." Op. cit., I, 217.

BEE.

Since bee-keeping is "inevitably and literally the oldest craft under the sun"¹ and since bees are so busy and well-regulated, demonstrating the possibilities of communal life, there has always been great interest in them, and, correspondingly, much fabulous matter credited to them.

Pliny said that their stings cure bears of blindness, that they lie on their backs to protect their wings from dew, and carry little pebbles for ballast in windy weather, that they are troubled by echo, mist and spiders, killed by the herb cornell or the smell of crabs, and brought back to life by fig tree ashes, that they are born of carrion or flowers, and so on. Other bee fables were that they sip honey direct from flowers, predict rain, hum hymns on Christmas Eve, and go to heaven when they die. And until late mediaeval times it was thought that they had a king. Basil wrote:

Bees.....give themselves to these labours under the guidance of a king and superintendent, and.....do not allow themselves to fly to the meadows without seeing if the king is flying at their head.....it is not election that gives

1. Tickner Edwards, The Lore of the Honey-Bee, p. x.

him this authority; ignorance.....often puts the worst man in power..... It is not hereditary.....it is only too common to see the children of kings, corrupted by luxury and flattery, living in ignorance of all virtue. It is nature which makes the king of the bees, for nature gives him superior size, beauty, and sweetness of character.....bees.....lose their lives with their sting..... 1

It was Charles Butler who first seriously attacked the king-bee theory. In his book, The Feminin' Monarchi', published in 1634, he declared that among bees "the mal's.....ber' no' sway at all: this being an Amazonian or feminin' kingdom". He then went into detail:

The Queen is a fair and stat'ly Bee, differing from the vulgar both in shap' & colour..... Besid's their Sovereign, the Bee's hav' also subordinate Governours and Leaders For differenc' from the rest, they ber' for their Crest a tuft or tossel, in soom cooloured yellow, in some murrey, in manner of a plum'..... 2

The Dutch naturalist Jan Swammerdam was apparently

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1. Op. cit., p. 97. Bees do not lose their lives with their stings if the stings are carefully withdrawn from the wound.
 2. Op. cit., passim. It is possible that pollen-grains, clinging to the heads of bees, may have suggested the tufts or tassels. Butler in his Preface explained that his book had been written with the "E silent" replaced by a "different Karacter: to wit, lik' an inverted Comma", "for the Readers eas". Butler did not mention the pebble-ballast story.

the first to offer thoroughly reasoned opposition to the pebble-ballast legend. He wrote:

It is a common opinion that the Bees in rough.....weather.....carry a stone..... to preserve themselves by its weight against the.....wind..... But this.....has not been hitherto remarked by any Bee-keeper..... There is a species of wild Bees not unlike the smallest kind of the Humble Bee, whichconstruct their habitations of pieces of stone and clay, sometimes carry such large stones, that it is scarcely credible by what means so tender insects can sustain so great a load.....'tis possible Bees may be sometimes seen to carry little stones, but these were not common Bees..... 1

Swammerdam also first brought forward the theory that the ancient belief in spontaneous generation of bees from carrion might have been caused by the fact that some fly maggots closely resemble the larvae of bees.

BEETLE.

It is still widely believed that beetles are blind and deaf, and that death-watch beetles tick off our last minutes. Pliny said that locusts and grasshoppers are also blind, that horse-flies die of blindness, and that beetles are killed

1. Swammerdam, The Book of Nature, p. 226.

by roses. It was also thought that beetles were bred spontaneously from carrion. Said the Hortus Sanitatis, "Scrabones dothe growe out of roten fowle horse fleshe..... Scrabei come also of the roten flesh of an horse.....they be flyenge wormes"¹

BEZOAR.

The bezoar stone is properly a biliary calculus from the gall bladder of an animal, but the word "bezoar" came to mean almost any kind of hard object from almost any part of the head or body of almost any animal or serpent. The "serpentstone" or "toadstone" type of bezoar came to be extraordinarily valued. The virtues of bezoar were supposedly discovered by Avicenna of Cordova in the twelfth century, and later a rich man of that city gave a castle for a bezoar to cure him of an illness. James II of Scotland owned a ring set with a "paddockstane". The bezoar remained popular for six hundred years and was to be found in London pharmacopeias until the middle of the eighteenth century.

1. Op. cit., p. 120.

BIRD OF PARADISE.

This beautiful bird was unknown to the ancients, and reports of it came first to Europe with the sixteenth century voyagers. One of the earliest notices of it came from Magellan, who after his 1521 journey said that the King of "Bachian" in the Moluccas had given him two preserved birds "of extraordinary beauty", which the natives called "bolondinata", or "bird of God". He said the birds' legs were "of the thickness of a common quill, and a span in length".¹ Soon a brisk trade in the birds sprang up. Their skins commanded a high price, but their legs were worthless, so the natives brought them in with their legs cut off. And thus arose the myth that the bird of paradise had no legs. Consequently, as a corollary myth soon had it, they never came to earth, never ate anything but air, and bred their young in flight - the males being fitted with small cups on their backs for transport of the eggs, during the endless flight. The notable traveller Tavernier advanced a theory for the apoderious condition:² he said

1. Cited from Ashton, Curious Creatures in Zoology, p. 191.
2. Linnaeus classified the emerald birds of paradise as apoda.

that the birds gorged themselves on nutmegs until they fell to the ground, whereupon ants came and ate off their legs. Swifts and martins were also thought to have no legs. Thomas Moufet in 1599 said "that famous bird of Paradise" fed on "nought but aire",¹ but Willughby in his Ornithology declared:

.....that the Birds of Paradise.....should want feet, as was not long since generally believed.....is now sufficiently convinced to be false by the testimony of eye-witnesses, and by the Birds themselves brought over in-tire, so that no man in his right wits can any longer doubt of that matter. 2

BLOOD.

The belief that a murdered man's wounds bleed in the presence of the murderer is at least eight hundred years old. In Scotland it was thought that the victim bled from the mouth or the nose when the murderer approached.

BONASUS.

Pliny defined this creature as a wild

1. Moufet, The Silkewormes, p. 39. For more discussion of Moufet, see "Spider" below.
2. Op. cit., p. 2.

beast in Paeonia

.....with a maine like an horse, otherwise resembling a bull; marie, his hornes bend so inward.....that they serve him in no steed at all for fight..... All the help that he hath, is in his good footmanship; and otherwhiles in his flight by dungingbehind him three acres in length..... It burneth.....like fire. 1

BUFFALO.

The belief that this animal, like the bull, hates red is untrue, according to modern authorities. The truth seems to be that all cattle are virtually colour-blind.

CAPRIMULGUS.

Pliny said there was a bird called "caprimulgus", or "goat-sucker", that looked like an owl and milked goats at night, "and looke what udder is so milked, it giveth no more milke..... and the goats become blind withall".² It is still widely believed by country folk that a certain kind of nightjar or whippoorwill is a goat-sucker. It

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1. Op. cit., I, 200. Shades of "The Land of Cockayne"! But Bonasus may actually be only an exaggerated bison. Many animals void when pursued.
 2. Op. cit., I, 292. Needless to say, this is fabulous.

is also still believed by some that various snakes milk goats or cows, despite the obvious fact that snakes' teeth are so placed that if the mouth were closed for suction they would pierce the putative donor's teat, whereupon, as the United States Department of Agriculture states, "the snake would find itself fully occupied in efforts to avoid injury....." Willughby in his Ornithology called the "Fern-Owl" a goat-sucker, but merely stated that one examined had seeds and beetles in its stomach, and made no mention of the supposed milking habit.

CATOBLEPAS.

Pliny described this fabulous creature as

.....a wild beast.....little of bodie.....
 heavie also and slow in all his limmes besides,
 but his head onely is so great that his bodie
 is hardly able to beare it; he alwaies car-
 rieth it downe toward the earth, for if he
 did not so, he were able to kill all mankind;
 for there is not one that looketh upon his
 eyes, but hee dyeth presently.

Fortunately, Catoblepas "keepeth" far away, near the head waters of the Nile.¹ This animal, which sounds something like a dispirited basilisk, changed

1. Op. cit., I, 208.

his spelling somewhat during the course of the centuries, but held on to his habits. Bartholomew thus described him:

Cacothephas.....little of body and uncrafty of members & slowe, & hath a full heavy head. And therefore they beare it alway downward.....by ordinance of kind for salvation of man kinde, for it is so wicked & so venomous, yt no man may behold him.....but he die..... 1

CENTAUR.

This combination of man and horse is very ancient. The Assyrians featured a cousin - a man-bull - in the old legend of Gizdhubar; the man-bull is named Hea-bani and is the son of Cronos himself. The Greeks as usual Hellenized the men-horses and made of them a people of Thessaly. They came to the wedding of Hippodamia and Pirithous and got so drunk and rude that Hercules and the Lapithae thrashed them and chased them to Arcadia, where presumably they remained. Pliny said they were not mythical beings, but only an imaginative way of describing the horsemen - that is to say, men on horseback - of Thessaly. Virgil placed centaurs at the gates of hell; Dante had them in the In-

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1. Bartholomaeus Anglieus, Batman Uppon Bartholome, p. 225.

ferno, shooting darts at violent men in the river of boiling blood, and in the Middle Ages they came to symbolize all forms of sensuality. The early naturalists interpreted Isaiah 13: 21, ".....and satyrs shall dance there (in Babylon)", as referring to centaurs. Aldrovandus pictured them as having arms like toads' legs, and no forelegs.

CHAMELEON.

Because these otherwise sluggish lizards dart forth their tongues so fast, to catch flies, that the eye can hardly see the motion, it was thought that they fed on nothing but air. Pliny said they were dangerous near fig trees, and had big lungs, no spleens, and very few other internal organs, and could attract birds of prey out of the air. The Bible classed them with snails, moles, mice and other unclean things. Bartholomew said chameleons live only on air, as do moles on earth, salamanders on fire and herrings on water, but Batman in an "addition" noted that "The Chamelion feedeth on Flies, and taketh them with the sodaine

slipping forth of his tongue....." ¹ Swammerdam examined a chameleon and declared that its tongue was propelled by force of air as well as by muscles.

COCK.

There were many fables about cocks. Indeed, the sixteenth-century natural historian Aldrovandus wrote so much about the cock, and the bull, that (according to Bullfinch) a long rambling story came to be called "a cock and bull story". In classical mythology the cock was dedicated to Apollo, because he gave notice of sunrise; to Mercury, because he summoned men to business, and to Aesculapius, because early rising was supposed to be healthy. From very early times the cock was the symbol of vigilance. The Christians made much of this fowl. Since the Nativity and the Resurrection had occurred near the time of cock-crow, and at that time Peter finally stopped denying Christ, they made the cock

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1. Bartholomaeus, op. cit., p. 353. Bartholomew wrote in the thirteenth century; Batman published his edition of De Proprietatibus in the sixteenth century, after the French naturalist Pierre Belon, murdered in the Bois de Boulogne in 1564, had refuted the fable of the chameleon living on air.

the symbol of the vigilant man of holy life, or of Christ Himself. In the Middle Ages it was thought that cock-crow routed evil spirits. In particular, the crowing of a white cock was of not much efficiency against witches, ghosts and so forth, but the crowing of a red cock was a clear warning to them, and the crowing of a black cock was the signal for their instant departure. It was thought that there was deadly antipathy between cock and lion, that the outline of lilies was traced on a cock's brain, and that cocks laid eggs. The basilisk or cockatrice was supposed to hatch from such eggs.¹ The word "cockney" is derived from the M.E., "cokeney", meaning "cock's egg". In pre-Renaissance times the occasional small and yokeless eggs laid by hens were called "cock's eggs", and the name was applied to foolish children, then to townspeople, who didn't know country ways, and finally to those persons born within sound of Bow Bells who were presumed ignorant of country ways and nature herself.

CORAL.

There were many coral theories, the com-

1. See also "Basilisk".

monest being that coral was a sort of underwater plant, that was soft until taken out of water.

Basil regarded it as one of the Lord's marvels:

How is it that coral, a stone so much esteemed, is a plant in the midst of the sea, and when once exposed to the air becomes hard as a rock? 1

The Promptorium Parvulorum, first English-Latin dictionary, compiled in 1440, defined coral simply as "ston",² but the soft-underwater-plant theory lingered on, long after it was disproved in the eighteenth century.

CROCODILE

There were two important crocodile fables. One was that the crocodile sheds hypocritical tears; as Bartholomew expressed it, "if the Crocodile findeth a man.....he slayeth him if he may, and then he weepeth upon him, and swalloweth him at the last".³ The other was that there is a certain small bird (or

1. Op. cit., p. 94.

2. Op. cit., p. 94.

3. Op. cit., p. 359. Crocodiles have no tear glands and cannot "weep". If they try to swallow something too big for their mouths, a watery liquid may ooze from their eyes.



reptile) that runs down a crocodile's throat and chews out his insides. Herodotus started this story with a reasonably accurate account of what modern observers have reported: when crocodiles doze they leave their mouths open and a trochilus, a small bird of the courser family, hops in and picks leeches or other titbits from their teeth. Aristotle slightly embellished the story, saying that the crocodile is so grateful to the bird that when he prepares to shut his mouth he shakes his neck to give warning to his "little friend".¹ By Pliny's time the tale was much more romantic, and confused. He mixed the trochilus with the regulus, or wren - which has nothing to do with crocodiles - and he declared that when this trochilus-regulus "cleanseth" the crocodile's teeth he is "lulled as it were fast asleep", whereupon the "rat of India" runs down his throat and bites a hole through his belly "and so killeth him".² In mediaeval England the story grew even more confused, with difficulties of language added: crocodile became cocodrill or cocadrylle or whatnot; trochilus became strofilos or cuschillos,

1. Hist. Anim., ix, 6.

2. Op. cit., I, 109. The rat of India was the ichneumon, or mongoose.

and instead of the ichneumon running down the cocodrill's gullet it was the strofilos. Marco Polo described crocodiles as if they had only two feet; Marlowe thought they were so hard that "on the flowery banks of Nile" they took "unaffrighted rest / While thundering cannons rattle on their skins," ¹ and by 1600 the various crocodile legends were hopelessly magnified and tangled.

DITTANY.

Pliny said that the plant dictamnus, or dittany, draws arrows out of wounded harts, and the mediaeval medicine men passed on the story, with additions. In Leechdoms, Wortcunning, and Starcraft of Early England (Herbarium, LXIII), it is said that dittany is so powerful that its smell alone kills snakes.

DOLPHIN.

There is a fish called dolphin and a mammal called dolphin, the latter - the "delphinus" of the ancients - occasionally confused with the

1. Tamburlaine, Part I, Act IV, scene 1.

porpoise. The fish-dolphin is famed for its swift and beautiful change of colours as it dies; the mammal-dolphin has been credited with traits more fabulous: according to Pliny, dolphins are "the swiftest of all other living creatures whatsoever, and not of sea fish only.....quicker than the flying fowls, swifter than the arrow shot out of a bow,"¹ and they love music and men, and are happiest when called "simo", or "snubnose".² Dolphins were also erroneously thought to be humpbacked, and to kill crocodiles with one fatal jab of the fin. Dolphins are in fact playful creatures which respond to attention - the old Plinian story of the dolphin which carried a little boy across the water from Baes to Puteoli was made to seem less fabulous recently when "Life" magazine (April 23, 1956) told of a New Zealand dolphin named "Opo" which took children for rides on her back - but their man-loving trait was greatly exaggerated by natural historians and poets. In the nineteenth century a certain Professor

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1. Op. cit., I, 238. Dolphins and porpoises can swim 50 m.p.h.; the cheetah can run 70 m.p.h., and Indian swifts have been timed at 200 m.p.h.
 2. Op. cit., I, 240. The word "porpoise" is derived from "porcuspiscis", or "pig-fish", because of the pig-like snout.

Schubert of Munich wrote a treatise to prove that dolphins loved art as well as music, and most particularly man, and that indeed the human race was descended from a dolphin.¹ Dolphins were thought to save sailors from drowning, and to transport the souls of the dead to the next world, and to be the link between fishes and land animals.

DRAGON.

The dragon, of course, is what the Irish would call the father and mother of all nature fables. He appears in all lands and at all times² and in a great many shapes. Basically, in the West, he has come to typify evil.³ Primitive man thought of dragons as combining the worst qualities

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1. Cited from Norman Douglas, Siren Land, p. 136.
 2. The author of this thesis once saw a dragon. It was twenty feet high, scaly, winged, and breathing great flames. He, the author, was about three years old and was dragged away by his parents before he could properly investigate. That dragon was real.
 3. In China the dragon is not so malevolent. There there is a bewildering profusion of dragons - "The small dragon is like the silk caterpillar. The large dragon fills the Heaven and the earth", as E.T.C. Werner states (Myths and Legends of China, p. 209) - and most dragons are if anything well disposed to men.

of snakes, birds and carnivores. Biblical dragons are a variable lot; some are frightful enough but others are rather timid, preferring waste lands where they will not be disturbed, and some sound quite attractive, e.g. Isaiah 13: 22 - ".....dragons in their pleasant palaces....." In classic times "draco" meant "serpent", and the word was used to designate gliding creatures from the smallest, such as were kept as pets in Roman houses, to the largest, such as bore Medea's chariot, and it is often difficult to determine whether an ancient writer is referring to an existing snake or to a mythical monster. Many of the Bible "dragons", for instance, were apparently serpents or lizards, of harmless disposition and modest dimension. Pliny of course had much to say about dragons of all sorts, and told of the terrible battles they wage with elephants and eagles. In the Middle Ages the dragon soared to a zenith of popularity in England. Bartholomew described him thus:

The Dragon.....is most greatest of all Serpents.....often he is drawn out of his den, and reeseth up into the aire, and the aire is moved by him, & also the Sea swell-eth against his venime.....oft foure or five of them, fasten theyr tayles together, and

reareth up the heads, & sayle over sea, and
over rivers, to get good meate..... 1

British dragons came in many shapes and sizes, but all seemed to have one trait in common: bad temper. As the Pigeon remarked after Alice ate a bit of the Caterpillar's mushroom and found her neck rising above the trees, "'Serpent!.....Serpent.....I've tried every way, and nothing seems to suit them!..... those serpents! There's no pleasing them!'" It is possible that such bad temper arose from the fact that nearly every Teutonic dragon needed to guard a treasure and/ or a maiden, and whenever he did the hero came along and killed him.

EAGLE.

The eagle, king of birds, was thought to be proud, able to look at the sun, and able to renew its youth by knocking off its overgrown beak, or by falling into water. It was said to take its chicks and make them look at the sun, and if they blinked or their eyes watered, it slew them or drove them from the nest. Bartholomew passed on Pliny's story that eagle feathers overcame the feathers of other birds. Eagles have always been confused

1. Bartholomew, op. cit., pp. 360 f.

with ospreys, and the "eagle" of the Bible, which renews its youth (Psalms, 103: 5) but is also an abomination (Lev. 11: 18), is apparently a vulture more often than it is our eagle. Augustine interpreted the old story that the eagle renews its youth to symbolize Christian resurrection, and its practice of looking at the sun was said to represent Christ's looking at the dazzling glory of God. The eagle is still thought to be chief and noblest of birds - The Pictorial Museum of Animated Nature, mentioned above, says eagles are

.....associated in our minds with ideas of courage, strength, and ferocity..... They live by slaughter; their life is passed 'in armis', and they carry on with unceasing activity the work of destruction: they rejoice in carnage, and cower (sic) with outspread wings over the reeking quarry, uttering shrieks of exultation..... 1

The truth is, according to Konrad Lorenz, that

.....all true birds of prey are, compared with passerines or parrots, extremely stupid creatures. This applies particularly to the golden eagle, 'the eagle' of our mountains and our poets, which is one of the most stupid among them, much more so indeed than any barnyard fowl.....

1. Op. cit., p. 255.

Furthermore, the eagle's famous love of liberty is only "supposed", and an eagle which he kept proved not only lazy and stupid and unable to find its way home, but "desperately afraid of a bicycle".¹

ECHENEIS

This fabulous creature grew out of two real animals - the barnacle which fastens itself to ships, and the sucker-fish, remora, which hangs on sharks. (Echeneis was alternatively called remora.) The confusion lingered long - Johnson in his Dictionary defined "remora" as "a kind of fish or worm that sticks to ships and retards their passage through the water". The fabulousness of the echeneis consisted in his ability to retard, to the point of stopping entirely, the passage of ships through the water. Pliny said that despite the power of man or nature, this "little sillie fishcompelleth ships to stand still....."² The

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1. Lorenz, King Solomon's Ring, pp. 51 f.
 2. Op. cit., II, 425 f. Pliny went on to moralize: "See the vanitie of man! alas, how foolish we are to make all this adoe? when one little fish, not above halfe a foot long, is able to arrest and stay perforce, yea and hold as prisoners our goodly tall and proud ships"

early Church Fathers moralized from echeneis.

Said Basil,

If now you hear say that the greatest vessels.....are easily stopped by a very small fish.....the remora, and so forcibly that the ship remains motionless for a long time, as if it had taken root in the middle of the sea, do you not see in this little creature like proof of the power of the Creator? 1

And the cathedral sculptors used the echeneis as a symbol of Christ, who keeps us from capsizing among the temptations of this world.

EEL

Only within the last fifty years was it established that most eels are spawned in the Sargasso Sea, that once-supposed "island of lost ships" of floating seaweed in the Atlantic.² Before that time it was thought that eels were spontaneously generated from various substances. It was also thought that they were sexless, and hated foxes, and had intercourse with vipers and so on.

1. Op. cit., p. 94.

2. The fable that the Sargasso Sea entraps ships was begun in 1896 when T.A. Janvier wrote a book, In the Sargasso Sea, describing it as an impenetrable tangle of weed.

Eastern people believe eels are the souls of the dead, or of the dregs of the population, and a Japanese legend says they are dragons in disguise.

ELEPHANT

Aristotle said that Ctesias was "obviously mistaken in his statement" that the semen of elephants solidifies to a hardness as of amber - "It does not".¹ This belief persisted for a long time after the fall of Greece, however, and so did others, much more fabulous, concerning elephants. Pliny said that they understood human language, worshipped the moon, wrote Greek, feared swine, mice, rats and leeches, and spent much of their time warring against dragons. It was also long believed that elephants had no joints in their legs. Basil accounted for this peculiarity by saying that if elephants were supported on "lax and flexible legs" the joints would constantly give way.² Since the beast could not bend its legs to lie down it had to sleep leaning against a tree. While it was so sleeping, hunters would

1. Aristotle, Generation of Animals, p. 163.
2. Op. cit., p. 106. Elks (q. v. infra) were also supposed thus jointless.

chop down the tree and take it - except when its dutiful child came to hoist it up and rescue it. The Church symbolists interpreted the elephant as typical of Adam and Eve, since they also fought against the great serpent. The elephant's child was Christ, who saves fallen man. The Bestiary said elephants live three hundred years, and "if one of them wants to have a baby, he goes eastward toward Paradise" with his wife and there they eat mandragora and she immediately conceives.¹ One legend had it that elephants had sexual intercourse only once in their lives, and produced but one child. They were therefore made symbols of chastity.

ELK

Julius Caesar reported that in the Hercynian forest there were several strange creatures, including unicorns and elks with no joints in their legs. Because of that jointlessness, Pliny said that elks could not lie down, but - like elephants - slept leaning against trees. It was also believed that elks' hooves were a sovereign remedy

1. White, op. cit., pp. 25 f.

against epilepsy. The Pharmacopoeia Londinensis of 1661 listed such hooves, or claws, as a preventive for epilepsy. In 1570 John Caius in De Rariorum Animalium described a young "hippelephus" from Norway, which was apparently a female elk, and stated that although it resembled an elk it could not be one, because Caesar had said that elks' legs do not bend. He wrote about this non-elk to Gesner, who replied that if Caesar said elks had no joints in their legs, Caesar lied.

FAIRY RING.

These circles in the grass are caused by fungi which grow outward in rings, changing the composition of the soil as they pass through it. Average progress is about eight inches per year, and some enormous rings are estimated to be more than four hundred years old. There have been numerous fabulous explanations, most of them based on the circular dancing of fairies, witches or other spirits. In Sussex the revel was said to be conducted by moonlight, or glow-worm-light, with drone beetles or grasshoppers providing the music. In the Tyrol it was said that the rings were caused by scorching by a dragon's tail: in Holland it was the

devil's churn; in France the rings were supposed to be inhabited by enormous toads with bulging eyes, and so forth. There was a good deal of superstition attached to the rings - as the old Scottish rhyme has it, "He wha tills the fairies' green,/ Nae luck again shall hae:/ And he wha spills the fairies' ring,/ Betide him want and wae:/ For wierdless days and weary nights/ Are his to his deein' day....."

FOSSIL

In Latin, "fossilis" is something "dug up", and until quite recently the word fossil meant a mineral or stone. The ancients did not trouble much about fossil remains; Pliny said simply, "There be bones growing within the earth, yea, and stones of a bonie substance".¹ It was generally supposed that they were sports of nature, or animal bones carried to unlikely places by the Flood, or imperfect attempts at spontaneous generation, or the bones of those giants mentioned in the Bible. Those who supposed that fossils were relics of very

1. Op. cit., II, 588.

ancient creatures, some now extinct, were bitterly opposed by rigid interpreters of Scripture, who maintained that the earth was not so ancient, having been created in the year 4004 B.C., and that God would not have permitted any species He had created to become extinct, since that would have been a demeaning of His authority. The battle raged until well into the eighteenth century.

FOX

Foxes have always been famed for their cunning, which has been exaggerated to mythical proportion. Of their many sly tricks, one became especially famous in the Middle Ages. As Bartholomew told the story, ".....when he lacketh meate, he faineth himselfe dead, and then fowles come to him, as it were to a carren, and anone he catcheth one and devoureth him....." ¹ Reynard the Fox, that most popular narrative which has been called the unholy Bible of the Middle Ages, told of Reynard

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1. Op. cit., p. 385. Bartholomew also said that the fox's right legs are shorter than his left, a deformity occasionally credited to badgers and other animals. Naturalists say that the famous dead-fox-catching-the-bird trick has never been observed.

catching the wife of Cawood the rook by this ruse.¹

GIANT

Poor giants! Of all mythological beings they have seemed most wretched. They are rarely introduced into a story but to be quickly slain; when left alone they can do nothing except bellow and swagger until some champion comes to overthrow them; they seem by nature gross, stupid, unable to use their vast strength, and often craven. But giants have proved more durable than most of their more agile and clever fellow-phantasms - partly because fossil bones of huge creatures have been thought to be giants' bones, partly because the Bible stated so clearly, "There were giants in the earth in those days",² partly because the word "giant" has come to mean merely "very big" instead of fabulously big, and partly because there has long been a belief that people are diminishing physically as well as apiritually. Until quite

1. Reynard the Fox, p. cliv. After thus catching poor Toptwig, Reynard "bolted feathers, bones and all." and left, "to mark the ruthless ruin done:- /Two feathers and one claw alone!" Reynard does not credit its hero with any other fabulous practices.
2. Genesis, 6: 4. Augustine said that Christ was the giant of giants.

recently it was thought that there once were whole races of true giants, and that our first ancestors were of gigantic dimension. In 1718 a certain M. Henrion calculated the heights of Adam, Eve, Noah, Abraham and Moses as 181 feet 9 inches; 118 feet 9 inches; 27 feet; 20 feet, and 13 feet respectively. There are still those who believe that in certain parts of the earth there are giants in these days.

GOAT

Pliny said that goat blood dissolves diamonds, that goats breathe through their ears, that various parts of them are remedies against various diseases, and other marvels. Goats were traditionally supposed to be most lecherous, as well as sure-footed and clever. Augustine passed on the Plinian tale of goat blood dissolving diamonds, and in mediaeval church carving the goat, because of its fondness for high places and its keen sight, was selected to be a symbol of Christ, the far-seeing. Goats also symbolized sinners.

GOBLIN

Unlike angels, ghosts, elves, fairies and

other such airy beings (too airy to be discussed here), goblins were often pictured very graphically in the Middle Ages. Pliny had said that mines "goe down as far as to the seat and habitation of the infernall spirits," ¹ and in succeeding ages there was general belief that mines were inhabited by gnomes or goblins. Agricola described them:

In some of our mines.....there are demons of ferocious aspect..... Demons of this kind are.....put to flight by prayer and fasting..... Then there are the gentle kind which the.....Greeks call Cobalos, because they mimic men. They appear to laugh with glee and pretend to do much, but really do nothing. They are called little miners, because of their dwarfish stature, which is about two feet. They are venerable looking and are clothed like miners in a filiated garment with a leather apron..... They are not very dissimilar to Goblins, which occasionally appear to men as they go to or from their day's work..... ²

Apparently our words "kobold" and "cobalt" both owe their origin to this idea of goblins of the mines - German miners called the goblins "kobolds", from the Greek "kobalt" meaning "mischievous goblins", and since a certain mineral ore hurt their feet

1. Op. cit., II, 453.

2. Agricola, De Re Metallica, pp. 216 f.

and troubled them in the mines they blamed it on the kobolds and called it cobalt.

GOSSAMER.

This filmy substance was a great puzzle to natural historians for thousands of years. It was thought to be resinous juices drawn by the sun's heat into threads; a sort of tough dew; plant fibres, and whatnot. The Promptorium Parvulorum defined "gossumur" simply as "corupcione". As late as the seventeenth century as clever a man as Robert Hooke stated that he thought it was of the same substance as the soft white clouds of summer. But by the end of that century the secret was out. In 1693 Sir Thomas Blount in his curious Natural History wrote:

The long Threads in the Air in Summer
.....have been a strange puzzle to the Wiser
World.....but I shall.....tell you the cer-
tain and immediate Authors of them..... I
say then, that all SPIDERS, that Spin in a
Thread.....are the Makers of these Threads,
so much wonder'd at..... 1

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1. Blount, op.cit., p. 318. Not all spiders, but only certain small ones, spin gossamer webs. The word "gossamer" is apparently derived from "goose" (because of its downy appearance) and "summer".

GRIFFIN.

This hybrid appears in much ancient art, in many forms, and was a favourite symbolic beast in Egypt, the Near East, Russia, Siberia and India. Herodotus said that griffins warred with a one-eyed people called Arimaspians over gold; Pliny passed on that story, describing the griffins as wild beasts that flew, having long ears and hooked bills, and in England the griffin came to be generally pictured as the child of a lion and an eagle, with the head and legs and wings of an eagle, and the body of a lion.¹ In early Church art the griffin, who carries oxen to his desert feeding-ground, symbolized the devil, who carries souls to the desert of hell. The griffin also symbolized Christ. Bartholomew said the "Gripe" or "Gripes" was

.....of coulour of a dark Oker on the bace,
their breast of purple coulour, their wings
browne and white, their talents blacke.....
he is more higher than the Lion, the hinder
feet cloven, as the Stagge, able to carrie
awaye the waight of two men.....in Scithia
is plenty of gold.....but for great gripes

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1. Cf. Alice in Wonderland: "If you don't know what a Gryphon is, look at the picture." (It is interesting to observe that Alice's gryphon has the standard British attributes plus Pliny's long ears.)

men dare not come thether openly..... 1

John de Mandeville said that one griffin was stronger than a hundred eagles. Moufet in his book on Silkewormes stated that, like the "famous bird of Paradise", ants and "Griphins strong" ate nothing but air,² and as late as 1675 the learned Jesuit Kircher catalogued griffins - and mermaids - among the creatures in the Ark.

HALCYON

The "halcyon days" in Greek mythology were the supposedly calm two weeks before and after the shortest day of the year, about December 21, when the ocean was made smooth by the gods so that the nest of the kingfisher, or halcyon, could float in peace while the chicks were hatched and reared. In time the phrase came to mean any calm days, and finally, any calm days of summer. Actually, the kingfisher builds no nest, but lays its eggs in

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1. Op. cit., pp. 185, 368. Batman noted in one of his "additions" to Bartholomew: "There are common Gripers in England, that devoure more men by usury, then al the Gripes in India, the fetchers of golde". - Ibid., p. 368.
 2. Op. cit., p. 39.

holes on the waterside. The objects taken for its nest are zoophytes which Linnaeus called halcyonium. Basil said that if "for so little a bird, the great, the fearful sea is held in check and is commanded in the midst of winter to be calm",¹ it is to induce us to ask God for salvation, since there is no wonder He will not perform for us, who have been made in His image. There was another popular belief about kingfishers: that if hung up by a thread they turned to the wind. Willughby in his Ornithology wrote:

The Kingfisher..... In a Nest in a hole about half a yard deep in the bank of a River we observed but five young ones. It is a Vulgar persuasion, that this bird, being hung up on an untwisted thread by the Bill in any room, will turn its Breast to that quarter of Heaven whence the wind blows: They that doubt of it may try it..... 2

HEDGEHOG.

There was only one particularly noteworthy fable about the hedgehog, and that was that he rolls over and spears apples or other fruits on his prickles, then carries a back-load home - and recent investigation has found that this fable may

1. Op. cit., p. 98.
2. Op. cit., p. 146.

not be so very fabulous after all. Frank W. Lane in Animal Wonder World, pp. 178 ff., cites various observations by reputable witnesses of hedgehogs thus spearing fruit as if for transport, and concludes: "there is a case for accepting the legend as a very interesting piece of authentic natural history". In early Church art the hedgehog typified the devil - as the hedgehog knocks off grapes and spears them and carries them home, so the devil robs men of their souls.

HORSE.

Horses used to be much more superstitiously regarded than they are now. A horse was the favourite animal of the solar hero in myths, and in primitive Teutonic ritual a horse skull was thought to be possessed of great magical power. The Saxons used a white horse as a symbol of victory. Revelation speaks of the famous four horses of famine, war, plague and death, as well as other horses, with lion-like heads, serpent-like tails and other appurtenances which only Blake could have properly depicted, and by Pliny's time horse legends were rampant. He said that Caesar had a horse with feet

like a man's, that Semiramis married her horse, that in Portugal mares are impregnated by the west wind - a very old and durable fable - and so on.

HORSEHAIR.

The standard myth - still widely believed in many parts of the world - that horsehairs, if put into water, will turn into snakes or worms is very old, and owes its origin doubtless to the once universal belief in spontaneous generation, and to imperfect observation. There are several kinds of worm that resemble the long hairs of a horse's tail. It was also believed that snakes thus produced had no venom - cf. Antony and Cleopatra, Act I, scene 2, in which Antony says, "Much is breeding./ Which like the courser's hair, hath yet but life/ And not a serpent's poison".

HYBRID

The possibilities of hybridization - the word is derived from the Greek "hubris", meaning "lewdness, wanton violence or insolence" - caused much exercise of imagination until fairly recent times, when it was established that cross-breeding

is possible only between closely allied animals. The Bible mentioned some startling hybrids: Daniel's eagle-winged lion and four-headed leopard and ten-horned beast with iron teeth were not so strange as the weird monsters of Revelation. Aristotle proposed the theory that hybridization resulted from mingling of different species of animals at water-holes. During the Middle Ages hardly the wildest mésalliance of creatures was thought improbable, or sterile. Pepys noted in his Diary, August 24, 1661:

Called to Sir. W. Batten's, to see the strange creature that Captain Holmes hath brought with him from Guiny; it is a great baboon, but so much like a man in most things, that, though they say there is a species of them, yet I cannot believe but that it is a monster got out of a man and a she-baboon.

When Humpty Dumpty explained to Alice that "toves" are "something like badgers - they're something like lizards - and they're something like corkscrews," she replied, "They must be very curious-looking creatures." His only comment: "They are that."

HYENA.

This creature in addition to its other

strange traits, such as having no neck joints and no gums, was supposed to change sex. Aristotle scoffed at this legend, but Pliny passed it on, and the Church exegetists used it to make the hyena the symbol of nameless vice as well as of the double-minded man. They also used the hyena, because of its practice of eating corpses, as a symbol of the Jews, who preferred the dry bones of the law to the living Gospel. Raleigh in his History of the World said that hyenas were offspring of dogs and cats, and first appeared after the Flood, since such evil beasts would not have been tolerated on the Ark.

LAPLAND WITCHES.

The general subject of witches is too large to be discussed here, but Lapland witches and their "bottl'd air" ¹ were such definite personalities during the Middle Ages that they merit attention. The myth that certain persons could control the winds goes back beyond Homer's Aeolus. In England it was generally believed that the ability was

1. Butler, Hudibras, part I, canto II, lines 343 f.: lawyers "sell their blasts of wind as dear,/ As Lapland witches bottl'd air."

concentrated in Lapland and the Scandinavian lands. Bartholomew said that in "Winlandia" (Finland?) the men sold wind, regulating it by the number of knots pulled out of a knotted thread, and "so theyr missebeleefe feendes moove the ayre.....sometime.....so stronglye, that the wretches that beleeeve in such doing, are drowned by dightfull dome of God".¹ The early Scots believed that both Finns and Laplanders sold three-knotted thongs which regulated the force of winds by number of knots loosened.

LION.

There have always been fabulous stories about the King of Beasts. Pliny said that lion cubs, like those of bears, were born shapeless, that lions were noble and gracious to the weak, that lions did not like men to look at them sideways, and that when they died they bit the earth and wept. He said also, among other things, that they feared cartwheels, cocks and fire. Lions became symbols of strength, ferocity and generous majesty. Physiologus said that lions had three traits: they brushed their tails over their foot-

1. Op. cit., p. 248.

prints, they slept with their eyes open, and their cubs were born dead, being brought to life on the third day by the father's roaring in their faces. These traits were explained by the Church to symbolize, respectively, the secrecy of the Incarnation (Christ being of course the Lion of the Tribe of Judah), the watchful "sleep" of Christ on the Cross, and the Resurrection. It was thought that lions treated kings as equals, protected virginity (among the higher classes), and scorned to eat dead flesh. Above all, they were brave. In Ray's time there was a proverb: a good surgeon had to have an eagle's eye, a lion's heart and lady's hand. As late as 1843 the notable Pictorial Museum of Animated Nature spoke of "the stern dignity.....enormous strength.....glowing eyes....." of "this terror of the desert....." ¹ The facts are, as Newell remarks in his Zoology of the English Poets, pp. 144 f., lions eat carrion and are not "noble and generous". Lorenz in King Solomon's Ring, pp. 50 ff., declares that the lion is not the "king of the

1. Op. cit., p. 2. The Pictorial Museum is not always wrong. It says that tigers are more to be dreaded than lions - because of their insidiousness - and that rhinoceroses do not rattle their horns together.

jungle", since the jungle is too wet for him, and "the lion is about the laziest of the predatory beasts.....indeed, quite enviably indolent....."

LONGEVITY.

The Bible said that Adam lived 930 years.¹ Methuselah lived 969 years, and various others of our progenitors lived for nearly as long. Aristotle said that men and elephants were the longest-lived of all creatures, and Pliny told of the blessed and happy Hyperboreans who never died at all. However, he said, most men must be dead by the age of 100 because our hearts increase in size by two grams yearly for the first fifty years of our lives, but thereafter decrease at the same rate. And he said that crows live nine times as long as men, harts four times as long as crows, and ravens three times as long as harts - which, allotting to man

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1. In the Old English Dialogue of Salomon and Saturnus, pp. 181 ff., Salomon tells Saturnus that Adam was thirty years old when he was created, lived thirteen years in Paradise before he "tasted the forbidden fig-tree's fruit, and that was on a Friday", lived 930 years on earth, "in toil and in misery; and afterwards he went to hell, and there grim punishments he endured five thousand years, and two hundred years, and eight and twenty years....."

his Biblical 70 years, would mean that a raven lives 7,560 years. Bartholomew said that "in Ireland is a little Iland, in which men dye not, but when they be overcome with age, they be borne out of that Ilande to dye without....." ¹ Willughby in his Ornithology, p. 356, declared that he could "easily be induced to believe" that swans lived 300 years. It is now believed that the "General Sherman" redwood tree of California, estimated to be some 4,000 years old, is the most ancient living thing on earth, but there are those who will have turtles, vines, and whatnot older.

LYNX.

The original "lynx" of Greek mythology was chiefly famed for his rôle as cart-horse for Bacchus - the god was drawn by a team of lynxes. There was also a man, or demi-god, named Lynceus. He was a cousin of Castor and Pollux and was so keen-eyed that he could see into the heart of the earth. (The word "lynx" comes from the same root

1. Op. cit., p. 232. Pliny said that his Hyperboreans, "when they have lived long enough..... leape from off a certaine rocke into the sea". Op. cit., I, 84, 156.

as "light" and "white" and "lucid".) Although Ovid does not speak of a metamorphosis of Lynceus into lynx, it is probable that somehow the two mingled to create the fabulous "lynx" of later legend - a wonderfully sharp-eyed hybrid, half-dog and half-panther. In addition to many stories of the marvellous eyesight of this animal, it was reported that its urine congealed to form amber. The modern "lynx" is a cat-like carnivore not remarkable for keenness of vision.

MANDRAKE.

Belief in the magical powers of this man-shaped plant is very old. Rachel permitted Jacob to lie with Leah for some of Leah's son's mandrakes.¹ The Babylonians as well as the Hebrews used mandrake for a soporific, and in the Middle Ages it was widely used as a form of anaesthetic. Its chief claim to fame was its fabled habit of shrieking when uprooted. So terrible was its

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1. Genesis 30: 14-16. Rachel did not say why she wanted the mandrakes, but modern scholars say it was because of the plant's supposed aphrodisiac powers. Mandrake has also been thought to be of medicinal aid to conception.

shriek that the man who heard it went mad, and to avoid this danger dogs were used to uproot the mandrake. (The dogs died of fear.) Pliny said that before uprooting mandrake one should stand with his back to the wind, draw three circles about the plant with his sword, then face west, and do his best. Neckham included mandrakes among roses, lilies, violets, parsley, mint, rue and other adornments of the twelfth century herb garden, but before 1600 the belief in the plant's magic was waning - Turner in his Herball said that mandrake does not, as had been believed, grow under the gallows, "nether doth it ryse of the sede of a man.....that is hanged". ¹

MANTICORA.

Aristotle, quoting Ctesias, said the "martichora" had three rows of teeth in each jaw, was as big and rough as a lion, with leonine feet, but had the ears and face of a man, with gray eyes. Its body was red, it had a tail like a scorpion, in which there was a sting, and it darted forth its

1. Op. cit., II, 46. Turner did not scoff at all alleged properties of the mandrake, however, and he was displeased with rogues who were peddling counterfeit mandrake roots - "folishe feined trifles & not naturall". - Ibid.

spines. It uttered a sound resembling the concerted noise of a pipe and a trumpet, and it was wild and devoured men. Pliny agreed with this description, adding that the beast could speak like a man. Manticora seems to have been originally a product of India, and it is thought that his name was derived from the Persian "mard-khora", or "man-eater". It has been supposed that he is only an idealized laughing hyena.

MERMAID.

Mermaids, or sirens, and their less frequently observed merman companions were firmly established as real creatures until very recent times. (Indeed, can it be said that the possibility of the existence of more improbable sea creatures than these has yet been disproved?) It is thought that they owed their origin to a variety of causes: the ancient semi-fish gods and goddesses of primitive religions; sea animals such as seals and sea-cows and walruses; wishful thinking, and so on. Said Pliny:

.....as for the Mermaids called Nereides, it is no fabulous tale that goeth of them: for looke how painters draw them, so they are in-

deed..... For such a Mermaid was seene
and beheld plainly.....neere to the shore
(near Lisbon): and the inhabitants.....
heard a farre off when it was dying, to
make piteous mone, crying and chattering
very heavily. 1

During the Middle Ages mermaids were of a siren disposition - as Bartholomew declared, "The Mermaiden is called Sirena, a sea beast wonderfully shapen, & draweth shipmen to peril by sweetnes of song....."² The Church Fathers likened Odysseus' vessel to the Church; its mast was the Cross, to which the faithful must cling, as did Odysseus, to avoid temptation by the sirens of worldly pleasures. The Promptorium Parvulorum defined "Mermaydn" simply as "Cirena". Only recently have mermaids shed their voracious and treacherous habits and come to be loving true-hearts such as the keeper of the Eddystone Light betrayed.

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1. Op. cit., I, 236. Pliny spoke of other mermaids and mermen, and wondered what song the "Meremaids" sang to "prince Ulysses". Ibid., 372.
 2. Op. cit., p. 380. Bartholomew added that "some men feine yt ther are three Sirenes some-deale maidens, and some deale fowles with claws and wings, and one of them singeth with voyce, and another with a Pipe, and the third with an Harpe", to draw shipmen to peril, "but the truth is, that they were strong whoores, yt drewe men that passed by them, to povertie & mischief....." - Ibid.

METAMORPHOSIS.

In the Middle Ages more kinds of transformation were imagined than Ovid ever dreamed of. It seems probable that the Indian theory of metempsychosis was mingled with classic mythology and faulty observation to create a teeming world of what Sir Thomas Browne called transpeciation.¹ Metamorphosis was even used to explain the knotty problem of what happened to birds in winter - it was supposed that cuckoos, and maybe swallows, became hawks in winter.

MONSTER.

The Bible spoke of many monsters, most of them the hybrid kind like the famous Whore of Babylon's steed, a "scarlet coloured beast.....having seven heads and ten horns".² And despite the Scriptural statement that "every kind of beasts, and of birds, and of serpents, and of things in the sea, is tamed, and hath been tamed of mankind,"³ belief

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1. "I do not credit those transformations of reasonable creatures into beasts, or that the Devill hath a power to transpeciate a man into a horse....." Religio Medici, part I, sec.30.
 2. Revelation, 17: 3.
 3. James, 3: 7.

in monsters of sea, land and air has persisted to the present day. Basil said that the monsters that dwell in the sea "are like high mountains, so witnesses.....tell me," ¹ and Augustine declared that monsters were so named because they demonstrate something.

MOON.

The moon was credited with almost as many magical powers as the sun, and the theories as to what the dark spots represented were endless. The Babylonians saw a man swinging a lion around his head (later this became Hercules and the Nemean lion); other people saw other things. In Neckham occurs the first known reference to the venerable British belief that the "man in the moon" was sent there for stealing thorns - he quotes a Latin version of a popular distich: "Rusticus in luna, quem sarcina deprimit una,/ Monstrat per spinas nulli prodesse rapinas." ² The Romance of the Rose said that on the moon we see a serpent with a tree on its back; Aldrovandus gravely spoke of a moon

1. Op. cit., p. 92.

2. Neckham, De Naturis Rerum, lib. I, cap. xiv.

woman who lays eggs, sits on them, and hatches giants, and so forth.

MUSIC.

It may be that some animals are influenced in some way by music - certainly some dogs howl when they hear singing, and various other creatures seem to respond to musical sounds. But the power of music to soothe the savage breast has been exaggerated since the days of Orpheus. In particular has the power of music to charm snakes been exaggerated. Modern investigators will not even admit that music affects snakes at all - the snake-charmer's "eerie squeaky music.....is a total loss as far as the snakes are concerned, for they are stone deaf", states O. P. Breland.¹ He explains the charmer's apparent ability to control his snakes by saying that the snakes are very sensitive to vibrations which the man sets up by tapping the basket or stamping on the ground; when a cobra feels certain vibrations he rears, and when his body is in striking position he follows the object of his attention with his eyes, so that the illusion

1. Animal Facts and Fallacies, p. 223.

of the music directing the snake's motions is created. Walter Map said that there was a Danubian fish so fond of music that it would follow organ sounds even though wounded to death, and dolphins were thought to be devoted to melody. Vipers were also supposedly deeply affected by music, but they did not want to be thus influenced, and to prevent it they stopped both their ears - as Topsell explained, by putting the tail in one and pressing the other to the ground.

NIGHTINGALE.

There were several old legends about nightingales, one of the best believed and best beloved being that the nightingale sang for sorrow, being in fact the reincarnation of Philomel, ravished by King Tereus when she visited her sister Procne, Tereus' wife. (Procne was changed into the swallow and Tereus into the hoopoe - although in some legends Procne became the nightingale and Philomel the swallow.) Another legend was that the nightingale sang mournfully because it sat all night with a thorn pressed to its breast, to prevent its falling asleep and being eaten by a snake.

Nightingales were supposed to die of shame if another bird sang better - Willughby mentioned that story in his Ornithology, without comment - and another myth was that originally the nightingale and a certain worm were created with but one eye each. One day the nightingale borrowed the worm's eye and forgot to return it, so now the bird has two eyes and the worm is the fabulous "blindworm". Shakespeare used this story, substituting lark and toad, in Romeo and Juliet, Act III, scene v: "Some say the lark and loathed toad chang'd eyes....."

OSPREY.

The osprey or sea-eagle was constantly confused with the true eagle, and most of the legends applicable to one were with equal facility credited to the other. Basil said that when eagles threw their chicks out of the nest, ospreys would take them and rear them with their own families. The osprey, more than the eagle, however, was singled out for the spurious notoriety of having two different feet - the legend was that one foot was clawed, for use on land, and the other webbed, for use at sea. This story was so en-

trenched in popular belief that Willughby in his Ornithology saw fit to mention it and term it "false and fabulous".¹ There was also a common belief that fishes turned on their backs and offered themselves to the osprey.

OSTRICH.

Little needs to be said about the two most popular stories of the ostrich - that it hides its head in the sand when pursued, and eats anything from church-door keys to horseshoes - except that they are not true. There has been a third well-liked story about ostriches, passed on solemnly by Neckham, to the effect that they are careless and /or cruel parents. That story is not true either.

PANTHER.

Panthers were supposed to be veritable storehouses of unusual powers and practices,

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1. Op. cit., p. 60. Willughby opined that the fable began because of "a presumption of the necessity of such a structure of the feet". - Ibid., p. 61. He went on to brand "not less fabulous" the story that the osprey drops into the water a certain "oyl or fat" which stupefies fish.

most of them beneficial to man. Indeed, so numerous were his attributes that it used to be thought that his name, panther, came from the Greek "pan", or "all". This animal, also called "pard", "luzerne", "libbard" or "leopard", was the friend of all other animals except the dragon, and its most usual act was to eat, wait three days, and then breathe forth so sweet a breath that all creatures were charmed by it - all creatures except the dragon, of course, which mortally feared the smell and could be almost killed by it. Pliny had said that panthers were so ugly that no other animals would look at them, and thus were forced to conceal themselves and lure creatures to them by their sweet smell - but the purpose of the luring was to catch and eat the victims of the smell. The Middle Ages beautified the panther, stripped him of his carnivorous intentions, and made of him a very proper symbol of Christ, Who influences men by sweet spirituality.

PEACOCK.

This bird was supposed to be as ashamed of its feet as it was proud of its feathers. Wrote

Bartholomew:

The Pecocke.....wondereth at the faire-
nesse of his fethers.....and then he seeth the
foulenesse of his feete, and lyke as he wer
ashamed, he letteth his fethers fall sodein-
lye.....he hath a voice of a feend, head of a
serpent, pace of a theefe..... 1

It was also thought that peacock flesh was incor-
ruptible; Augustine praised it as triumphing over
the corruption from which the flesh of Plato was
not exempt. Probably this belief joined with the
old pagan reverence for the peacock as Juno's bird,
and its habit of shedding its feathers in winter,
to regain more glorious plumage in the spring, caus-
ed the Church Fathers to make the peacock a symbol
of immortality. Willughby in his Ornithology said
that the alleged habit of the peacock of letting
fall his feathers because of shame of his feet was
false, and hazarded the opinion that, if kept dry,
turkey or chicken flesh would defy decomposition as
well as peacock flesh.

PEGASUS.

The winged horse was a favourite of Greek

1. Op. cit., p. 187.

mythology. Bellerophon rode on Pegasus against the Chimaera, and when the Muses fought with the daughters of Pieros, and Helicon rose heavenward with joy, Pegasus gave it a kick, and brought forth out of the mountain the inspiring waters of Hippocrene, earning the gratitude of all poets. Pliny said Pegasus was "with wings and armed with hornesand.....they say.....should be in Scythia".¹ Pegasus later became vicious and was a long time dying; the Hortus Sanitatis soberly described him as

.....a mighty gret beste & it is in the londe of Ethiope & is formed lyke an horse wth winges greter than an egle, & it hath gret hornes in his hede, and it is like a monster for al other bestes be of it afrayde.....but it persecuteth man moste of all. 2

PELICAN.

The myth that pelican mothers peck open their breasts and feed their children with their blood apparently began in Egypt, because of faulty observation. The bird sometimes has pinkish feathers on the breast or a pinkish tip to the bill;

1. Op. cit., I, 206, 209.

2. Op. cit., p. 64.

the gullet is occasionally bloody from pricks made by spines of swallowed fish; pelican mothers as well as fathers feed their young from their pouches - often the chicks thrust their entire heads into these capacious containers. The impression of breast-laceration and feeding with blood could be formed without overstraining the imagination. The Church Fathers picked up this legend very early and made the self-sacrificing mother pelican the symbol of Christ. The pelican was also used to typify the despairing soul - perhaps because of the bird's mournful attitude after feeding; when it has gorged itself it stands for hours with its bill resting on its breast. By Shakespeare's time the pelican legend was one of the strongest of all, and one story went that not only did the mother bird feed her young with her blood, but also did she thus revive them from death (having killed them herself three days before), and in so doing lay down her own life. Moufet in Silkwormes, p. 43, called her "that renowned dame,/ Who bleeds to death, her dead ones to revive....."

PHOENIX.

The origin of the unique bird is thought

to have been a combination of ancient Egyptian altar-worship at Heliopolis, and the date palm, in Greek called "phoenix", a symbol of fruitfulness and thought by the ancients to be among the longest-lived of things. Pliny gave the standard account of the phoenix:

By report he is as big as an Aegle: for colour, as yellow & bright as gold..... about the neck.....the body a deepe red purple: the taile azure blew.....with feathers of pure cornation colour: and the head bravely adorned with a crest..... He liveth 660 yeares: and when he groweth oldhe builds himselfe a nest.....of the Canell or Cinnamon, and Frankincense: and when he hath filled it with all sort of sweet Aromaticall spices, yeldeth up his life thereupon..... His bones & marrow there breedeth at first.....a little worme; which afterwards proveth to be a pretie bird. And the first thing that this yong new Phoenix doth, is to performe the obsequies of the former Phoenix late deceased: to.....carie away his whole nest into the citie of the Sunne near Panchaea, and to bestow it full devoutly there upon the altar..... 1

In the Middle Ages the Phoenix came to typify the mystical union of sexes; the renewal of life; immortality in general, and rarity or uniqueness. As The Romance of the Rose put it, "A virtuous woman! Nay, I swear / By good St. Denis, that's more rare /

1. Op. cit., I, 27.

Than is a phoenix".¹ In the early seventeenth century the famous Tradescants boasted two phoenix feathers (as well as a "natural dragon") in their London museum, but Willughby's Ornithology dismissed the phoenix, along with griffins, harpies and ruks, as fabulous.

PIKE.

It was thought that this savage fish had movable teeth, and that when injured it healed itself by rubbing against the tench. Dame Juliana Barnes in her Treatyse of Fysshynge wyth an angle said that the "Tench is a good fyssh: and heelith all manere of other fysshe that ben hurte yf they maye come to hym".²

PLANT SIGNATURE.

Sympathetic magic, or belief in the importance of similarity, caused the ancients to credit various plants with the ability to cure dis-

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1. The Romance of the Rose, lines 9107 ff.
"Friend" talking to "Lover".
 2. Treatyse of Fysshynge wyth an angle, p. 17.
Dame Juliana in this excellent fifteenth century work went on to urge fishermen to refrain from being "to ravenous in takying of your sayd game as to moche at one time....."

eases of organs which the plants resembled. The mediaevals carried the belief to the farthest extremes, drawing up endless lists of such cures by appearance. Walnuts, resembling little brains, were prescribed for brain fever; viper's bugloss, resembling the head of a viper, was recommended for viper bite; the heart-shaped leaf of the wood-sorrel was prescribed for the making of cordials, and so forth. Butler scoffed at the old notion, referring to the "antic fools" who "Seek out for plants with signatures,/ To quack of universal cures",¹ but the belief in plant signatures outlasted him and his century.

PORCUPINE.

Some modern authors seem to believe that the fable that the porcupine shoots his quills began with Marco Polo, who reported such action on the part of Asian porcupines early in the fourteenth century, but actually the myth is far older. Pliny said that the "Porkpen" had longer and sharper quills than the hedgehog, "and those, when he

1. Hudibras, part III, canto 1, lines 327-30.

stretcheth his skin, he sendeth and shooteth from him....." ¹ The truth is that porcupines cannot ejaculate their quills, but they can thrash their tails about wonderfully quickly, and the quills are very loosely attached, and stick into anything or anybody touched, so readily that it might easily be supposed they had been thrown. Joseph Hall in his Virgidemiarum, said that "Satyre" should be "like the Porcupine,/ That shoots sharpe quills out in each angry line....." ² John Evelyn in his Diary, October 4, 1658, said that he had seen a porcupine "of that kind that shoots its quills....." The belief is still very widespread.

PRENATAL INFLUENCE.

Belief in the power of events affecting the mother - or father - to influence the child's make-up during pregnancy is untraceably old. Aris-

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1. Op. cit., I, 215. George Stimpson (A Book about a Thousand Things, pp. 400 f.) and Claudia de Lys (A Treasury of American Superstitions, p. 123) both ignore this plain Plinian statement and trace the porcupine myth back no farther than Marco Polo.
 2. Virgidemiarum, lib. 5, sat. 3.

totle said a man of Chalcedon was branded on the arm and the same letter, "though somewhat confused and indistinct, appeared marked on his child".¹ Jacob caused Laban's flocks to give birth to speckled or brown offspring at will. Throughout classic and mediaeval times there were innumerable instances, some of them well-authenticated and most of them picturesque, of wonderfully exaggerated prenatal influence. It was thought that King James I and VI was afraid of swords because his mother had seen a sword-fight in her room during her pregnancy. At any rate, when he knighted Sir Kenelm Digby in 1623 the monarch "was so struck with terror at the sight of his own sword that he nearly poked out Digby's eye".² In particular was it thought that harelip was caused by prenatal action of a malicious spirit. Shakespeare alludes to this belief in King Lear when he has Edgar point out "the foul fiend Flibbertigibbet" who "squints the eye, and makes the harelip".

1. Op. cit., p. 53.

2. Petersson, Sir Kenelm Digby, p. 66. The situation was saved when Buckingham stepped forward and "very significantly" guided the King's hand.

PYGMY.

This word is derived from the Greek "pygme" meaning the distance from elbow to knuckles, and was used by classical writers to describe a supposed minute race of men living somewhere in Ethiopia. Mythology tells of Hercules' visit to Pygmy-land, a visit to which Swift was much indebted, and Homer passed on the old story of the war between pygmies and cranes. Aristotle gave more details, saying that the pygmies lived in holes under the earth, came out in harvest time with hatchets to cut down the corn, and rode to war on goats and lambs of proportionate stature. Pliny had little to add, and the legend remained remarkably constant for more than a thousand years. The Hortus Sanitatis said pygmies were

.....men & women & but one cubite longe dwellinge in ye mountaynes of Ynde.....fullgrowen at their third yere & at their seven yere..... olde.....where soever they fynde any cranes nestis they breke all the egges & kylle all the yonge.....because ye cranes do them many displeasures.....these folke cover their houses with the cranes fethers & egshells. 1

With the age of exploration, however, the pygmies

1. Op. cit., p. 64.

widened their range, and were reported from many lands. Mandeville spoke of them and Marco Polo warned of fake ones, Olaus Magnus told of pygmies in Greenland (modern Eskimos?), and Purchas said there were pygmies in Iceland who could only hiss like geese. And so the pygmies, who were originally thought to be a single race of tiny persons living in Africa, were spread all over the world, and the name came to be synonymous with dwarves. Late in the last century it was established that there really is a diminutive race of human beings living in central Africa.....only not quite so small as poets have made them, and not so mortally at war with cranes. The pygmies, who were very probably real at first, became fabulous, and finally made their way back to actuality.

ROC.

There have always been traditions of gigantic birds, and Sinbad's roc was a mixture of various legendary winged monsters from East and West. When travellers brought back tales of the huge condors of the Andes it was thought that they

were but new versions of the old legend of the giant bird, and the prudent John Ray, one of the great naturalists of the seventeenth century, would not include condors in his edition of Willughby's Ornithology.

ROMULI.

The idea that wild beasts receive lost infants and raise them to maturity (and usually extraordinarily successful careers) has been, is, and will be most appealing. Wrote Pliny:

As for babes.....cast forth to perish and suckled by.....wild beasts, like as Romulus and Remus our first founders.....such things in mine opinion are in all reason to be attributed more to fortune and fatal destinies, than to the nature of those savage beasts. 1

Science fiction writers have now widened the old concept to include the raising of children by robots and extra-planetary visitors.

SALAMANDER.

In classic times the salamander was a

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1. Op. cit., I, 204. It is said that when Kipling read Tarzan of the Apes he vowed never to write another Mowgli story.

fabulous lizard that lived in fire, and asbestos was called "salamander's wool". The mediaevals magnified the salamander into a somewhat offensive animal, and thought that "salamander's wool" was really salamander's wool. Bartholomew said that the creature was one of the four elementals, living by fire as did the chameleon by air, the mole by earth and the herring by water, and Paracelsus etherialized further: he said that salamanders were spirits of flame as gnomes were spirits of earth, sylphs of air and undines of water. (Cf. Pope's Rape of the Lock.) Actually there are small sluggish lizards which when threatened by heat spew forth a little white stuff, which might put out a safety match, and these lizards are called salamanders, but how they came to be credited with supernatural flame-quenching ability is not clear.

SCORPION.

Orion boasted to Diana and Latona that he would kill every animal on earth, and so the goddesses sent a scorpion which stung the mighty hunter to death. Scorpions have always been regarded

as fabulously venomous and fierce. Pliny had a great deal to say about them, including these notable fancies: scorpions in Scythia kill hogs but in Caria they kill no strangers; in Africa they fly; their poison is stultified by earwax, goat dung, dragon liver, brimstone, the company of women and other specifics; they are killed by radishes, and they eat their young, although sometimes one crafty child hides on its mother's back until the feast is over, and then proceeds to eat both his parents. Pliny did not mention one of the scorpion fables that later attained great popularity - the fable that a scorpion, if surrounded by fire, stings himself to death. In mediaeval England scorpions came to typify the essence of vicious evil - when Macbeth was meditating the double murder of Banquo and Fleance he said, "O, full of scorpions is my mind....." As a matter of fact the sting of a scorpion is painful but rarely fatal to man, and modern observers believe that a scorpion ringed by fire may appear to commit suicide but is probably only lashing his tail about in panic, and dies by heat and accident.

SEA.

There were nearly as many legends about the sea as there were about the sun, moon and stars. Among the more popular ones in literature was the belief that the sea rejects dead bodies - when Alexander went to the bottom of the sea in that glass ball he took with him a rooster, to tell the time of day; a cat, to purify the air (since cats often lay with their faces against children's, it was thought that they breathed in our foul air and breathed out air good for our consumption), and a dog, to be slain if anything went wrong - Alexander would then hang to the dog and be cast out of the sea with it. Another popular belief - still held by many - is that men die only at the ebbing of the tide.

SERPENT.

It is hard to separate fables about ordinary snakes from those concerning greatly exaggerated or wholly imaginary dragons. And there are hundreds of fables about serpents small and large. The serpent of Eden caused mediaeval Europeans to endow snakes with more guile and malice than they

actually possess, and they came to typify temptation in its more attractive forms. One belief in particular has been popular - the belief that snakes charm birds. Modern observers say that if such an apparent "charming" takes place, it is because the bird is affected by intense fear.

SPHINX.

The Greek sphinx was woman-headed, lion-bodied, and winged; the Egyptian sphinx was man-headed, lion-bodied and wingless. There wasn't much of any English sphinx - the fabulous monster never became popular in Europe - but it was known and respected enough for English Church sculptors to use it, probably as a symbol of spiritual knowledge and strength. (The Egyptian stone sphinx was a typification of the sun-god, Ra, and is older than the great pyramid of Cheops. It is 140 feet long, and its head measures 30 feet from crown to chin.)

SPIDER.

Spiders were credited with mortal poison

and were classed with toads as repulsive and malignant to man, and - although they are obviously busy all day long catching and eating flies and other victims - they were sometimes thought to subsist, like the bird of paradise and chameleon, on air. Said the Bestiary, "A Spider is an air worm, as it is provided with nourishment from the air, which a long thread catches down to its small body".¹

SPONTANEOUS GENERATION.

The belief that living organisms can be created out of non-living matter, or from organisms of a different sort, began with human curiosity, and is not extinct yet. With invention of the microscope and application of the scientific method to investigation, the old fable was dealt shrewd blows in the seventeenth century, but not until the time of Pasteur was the theory officially discarded. While it was thought that many little animals arose

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1. White, op. cit., p. 191. It has been suggested that Little Miss Muffet of tuffet fame was Miss Patience Muffet, daughter of Dr. Thomas Muffet, or Moufet (died 1604), author of The Silkwormes and their flies, but no record of the nursery rhyme has been found before 1805.

from many different materials, the most popular spontaneous generation notions were that bees and flies and many other small winged creatures arose spontaneously from carrion of various sorts, and that man, when buried, was devoured by spontaneously generated worms. This disturbing notion is still with us. Byron in "The Giaour" speculated on whether "the dead could feel / The icy worm around them steal, / And shudder, as the reptiles creep / To revel o'er their rotting sleep....."

SUN BLACKENS.

According to common belief the dark peoples of the tropics were made so directly by the sun. As Pliny expressed it, "doubtlesse it is, that the Aethyopians by reason of the Sunnes vicinitie, are scorched and tanned with the heat thereof....." ¹ The prevailing opinion is that dark skin serves as partial insulation against the sun's heat, and so dark races might in course of thousands of years result from natural selection. Bartholomew said

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1. Op. cit., I, 36. In the north, he said, people have white skin and yellow hair and are "fierce and cruel by reason of the rigorous cold airs....."

that Ethiopia was called "Negroes lande" because of the "coulour of men. For the Sunne is nigh, and roasteth and toasteth them....." ¹

SWALLOW.

The belief that swallows hibernate in caves or in the mud under water dates back before Aristotle and still is not extinct. As Dr. Johnson remarked in 1768, "Swallows certainly sleep all the winter. A number of them conglobulate together, by flying round and round, and then all in a heap throw themselves under water, and lye in the bed of a river".² The old legend was given new impetus recently. In a California canyon a Nuttall's poorwill was found in a torpor, in winter. There was no detectable heart beat or breath, and the bird's temperature was between 64 and 67 degrees, as compared with the normal 106. In the spring it revived and flew away. But almost all birds, including swallows, migrate. And none hibernate under water.

1. Op. cit., p. 224.

2. Boswell's Life of Johnson, II, 55. The word "conglobulate" is not in Johnson's Dictionary.

SWAN.

It is thought that the belief that swans sing as they die may have arisen from the fact that certain whooper swans do make a noise that could be called singing, and on rare occasions a wounded or dying swan produces sounds which differ from the ordinary noises made by these birds. It has even been supposed that the legend arose from the circumstance that swans' wings in motion make a sort of harmonious sound. Pliny doubted the tale: "experience in many hath shewed the contrarie."¹ But it was firmly espoused during the Middle Ages. Bartholomew said the swan's name, "Cignus", was derived from "Canendo, singing", and pointed out that the bird's long neck was "diversly bent to make divers notes...."² Willughby in his Ornithology discussed the supposed singing of swans, cited various authorities pro and con, including one George Braun who had testified that flocks of swans greet ships returning to London with loud and cheerful singing, and concluded that the story was unlikely.

1. Op. cit., I, 282.

2. Op. cit., p. 182. Bartholomew said that swans do not sing only at death - in Hyperborea, when harpers play, "the Swans birdes flye out of their neasts, and sing full merely".

TARANTULA.

The European tarantula is only mildly poisonous, but in the sixteenth century the people of Taranto, Italy, where the medium-sized "wolf-spider" called tarantula is particularly numerous, became obsessed by a superstitious dread of these spiders. Some kind of mass hysteria seems to have developed, and many believed that only wild dancing to suitable music could cure the victim of a tarantula bite. (Thus arose the dance known as "tarantella".)

TOAD.

Most people feel about toads as did Lear's Old Person of Rhodes, who strongly objected to them and "paid several cousins, to catch them by dozens....." Their unfortunate appearance has long caused them to be accounted as mortally venomous - in the seventeenth century there was a proverb, "As full as a toad is of poison",¹ and they were grouped with bats and spiders as most evilly magical of creatures. The beliefs about them were as numerous as they were horrid. Actually, toads

1. Ray, op. cit., p. 188.

are not venomous. And they do not cure warts any more than they cause them.

TURTLE.

There is an old story that an eagle mistook the bald head of Aeschylus for a rock and dropped a turtle on it, killing the poet. It is easier to postulate an origin for this legend than for the other turtle fable that once was so popular, the fable that turtles weep. The French diver Cousteau says that in the process of egg-laying mother turtles seem to force drops of moisture out of their eyes, and when turtles come to the surface of the sea to breathe they often make a sighing noise, but why or how these rather tranquil creatures became credited with the emotions and physical equipment necessary to produce the woeful sobbing attributed to them has not been determined.

UNICORN.

The unicorn is very old, and seems to have been a mixture of various animals, mythical and otherwise, from East and West. In Chinese

folklore there was a beast called a "ki-lin", gentle and unconquerable, with a voice like a monastery bell, which had a single short horn, and in Mediterranean lore there were several kinds of one-horned creatures. The "unicorn" of the Bible is now thought to have been the r'em, or aurochs, quite a real animal in those days, but by Pliny's time legends of a wonderful one-horned beast, apparently an amalgam of the rhinoceros and various mythical beasts, were growing in favour. Pliny said the "monoceros" was the "most fell and furious beast of all other" with a body like a horse, head like a stag, feet like an elephant and tail like a boar, with a black horn two cubits long.¹ Garbled reports of gazelles or other fleet creatures seen in profile may have also been incorporated into the mixture. At any rate, the unicorn came into Britain with the best of references, and there became one of the heraldic beasts most admired throughout the Middle Ages. As a graceful, noble, powerful but gentle animal conquerable only by a virgin, he came to represent Christ, who took on humanity in a

1. Op. cit., I, 206. Pliny also described a "rhinoceros" as having one horn in his snout.

virgin's womb. It was thought that a maiden's alleged virginity could be tested by a unicorn - if he put his head in her lap, she was a virgin, but if he ran her through with his horn, she was not. And there was also a theory that unicorns could be fooled and mistake young boys dressed as girls for virgin girls. Indeed, the unicorn of the seventeenth century was so far removed from his "fell and furious" rhinoceros-ancestor that, as will be seen later, a Fellow of the Royal Society in 1680 was unable to recognize the unicorn as what Pliny had described. (In this respect it is interesting to note that the Promptorium Parvulorum defined a "Unycorne" as a "beeste.....Rinoceros".¹) Unicorn horn, called for the sake of euphony "alicorn", came to be valued at ten times its weight in gold. "Alicorn" was sometimes powdered and used to cure all kinds of ills, and sometimes it was kept intact - in which case it was usually a narwhal tusk. The royal bedroom of Queen Elizabeth contained alicorn. Not until the early nineteenth century, when Cuvier laid it down as a rule of nature that animals with cloven hooves could not have horns in the

1. Op. cit., p. 508.

middle of their foreheads, did science formally disavow the unicorn. The antagonism between lion and unicorn referred to in the nursery rhyme has been supposed to be derived from ancient Chaldean symbolism, the lion representing golden-bearded summer, the unicorn, or white horse, the spring.¹

VAMPIRE.

The vampire was originally supposed to be the ghost of a heretic or criminal who returned to earth at night to suck the blood of sleepers, thus making vampires of them in turn. In time this apparition became confused with the vampire bat, and the werewolf, with the result that writers like Bram Stoker could destroy the sleep of countless people with books like Dracula, the ghost-bat-wolf.

VEGETABLE LAMB.

This myth apparently grew up in the Middle Ages out of tangled tales of "wool-bearing trees" - cotton. Herodotus said that in India

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1. English nursery rhymes contain at least eight other references to "unnatural natural history": duck, bat, owl, polliwog, newt, toad, snail, wren.

there were wild trees bearing wool of which the men made garments. Pliny confused this cotton with silk and flax and reported that in India there were cotton trees. Mandeville wrote that in the kingdom called "Cadissen" there grew a kind of fruit containing

.....a Beast as it were of flesh, bone and blood, as it were a little Lamb without Wooll, and men eat the Beast and fruit also, and sure it seemeth very strange. Nevertheless, I said to them, that I held that for no marvel, for I said that in my Countrey are Trees that bear fruit that become Birds flying, and they are good to eat..... 1

The "vegetable lamb" of the early Renaissance, also called the Scythian or Tartarian lamb, or the "bonarets" or "barometz" or whatnot (the latter names suggested by the Tartar word for "lamb"), was thought to grow on a stalk to which it was attached by its navel. It nibbled the grass as far around the stalk as it could reach, and then starved to death, if it wasn't eaten first by wolves.

VIPER.

The viper, also called adder, of Europe

1. The Voyages and Travels of Sir John Mandeville, Knight, p. 118. The flying fruit of the patriotic Sir John was of course the barnacle goose.

and Asia, is a very poisonous snake, but not so poisonous as has been thought. The most common fables about these unpleasant creatures were that their poison was so fatal that one drop of it would kill any living thing (except possibly a unicorn or basilisk or something even more marvellous) instantly; that viper babies gnawed their way out of their mothers' wombs, and that vipers called lampreys out of the sea for sexual union. Vipers were also credited with many magical curative powers; Robert Boyle commended dried viper flesh as a useful cordial. And it was thought that vipers so feared the power of music that they stopped their ears against it. Psalm 58 says that the wicked are like the adder which stops her ear, and "will not hearken to the voice of charmers, charming never so wisely". Topsell (q.v. supra under "Music") specified how this ear-stopping was done.

VIRGULA DIVINA.

Belief in the marvellous powers of wands was as widespread as it was ancient. The Babylonians and the Magi of Media and Persia used divining rods; so did the Hindus of the Veda period, 1500

to 1000 B.C., and such wands or sticks were in common use among Greeks, Romans and outlying groups like the Druids. Circe used a wand to change Odysseus' companions to swine. Moses and Aaron contended with rods against the rods of the Egyptian magicians (which were changed into serpents), and Moses smote the rock with his wand and brought forth water. Herodotus said that the Scythian soothsayers foretold the future with willow wands. Agricola declared that use of the wand to detect subterranean ores was a practice of "impure origin with the magicians", and therefore a miner, "sincehe ought to be a good and serious man, should not make use of an enchanted twig....." ¹ The use of divining rods to find water is still very widely believed in and practiced, and the writer Kenneth Roberts recently wrote a book, Henry Gross and His Dowsing Rod, purporting to prove the efficacy of this practice. The United States Bureau of Mines has gone on record thus:

.....the divining rod is either a fraud (whether deliberate or unintentional) or is based on some physiological principle

1. Op. cit., p. 41.

of which at present we know little or nothing - like the sense of direction in migrating birds and fishes.

WEREWOLF.

The legend that human beings are transformed into wolves, or other animals, and back again has existed in the folk beliefs of all countries, and is intricately mixed with primitive religion. Herodotus spoke of Neurians who were changed to wolves for a few days once a year. Pliny stated that the fable of lycanthropy was a "lowd lie", but admitted that the belief was so firmly established "that when we would give men the most opprobrious words of defiance that we can, wee tearme them Versipelles", and he told two stories of werewolves.¹ In Europe, the general belief was that werewolves assumed their animal form at sunset, ate men - living or dead - and had to return to their human bodies by sunrise. They made the change by rubbing themselves with a magic ointment, or by donning a magic girdle, or by turning themselves inside out. The English ones, after wolves

1. Op. cit., I, 207. "Versipelles" means "turn-coats".

disappeared from England, became hares. After burial they might become vampires. Some critics say that the wolf of "Little Red Riding Hood" was a werewolf. The literature is full of tales of them.

WHALE.

Like the roc in the air and Behemoth on land, Fastitocolon or Leviathan, the whale, entered the realms of mythology by relatively simple exaggeration. Fastitocolon, the sea-creature so tremendous that mariners mistook it for an island, camped on its back and were finally destroyed by it, apparently was born in Pliny. He said that whales, or "Whirlepooles", were four acres big, 600 feet long, 360 feet wide, and reared up out of the sea.¹ Leviathan of the Bible may have been a crocodile, or a sea-serpent, but in the Middle Ages it became confused with Fastitocolon and both were confused with real whales. Basil said that whales were called "great" not because they were "greater than a shrimp and a sprat, but because the size of their bodies equals that of great hills. Thus when they

1. Op. cit., I, 235. It is thought that Melville consulted Pliny for whale lore.

swim.....one often sees them appear like islands".¹

WILD MEN.

Pliny listed so many wild men that even the marvel-hungry Middle Ages did not have to trouble to elaborate on his catalogue much. He spoke of Aegipanes, "halfe wilde beasts", and As-tomi, "no-mouths" who lived by "smelling.....sweet odours", (bad smells killed them), and Atlantes, who "look wistly upon the sunne.....with most dreadful curses" and never dream, and Blenmyi, who "have no heade, but mouth and eies both in their breast", Calingians, who live not more than eight years, Lotophagi, Monoscelli, the notorious "umbrella-feet", the happy Hirpax, who walk "in great jolitie" through fire, and so forth and so forth.² Not even John Mandeville had to bother to think up new wild men when the Pliny collection was available.

1. Op. cit., p. 94.

2. Op. cit., passim. Pliny's list of wonderful people went right on into the next world; "in the deserts of Affricke yee shall meet oftentimes with fairies, appearing in the shape of men and women, but they vanish soone away like fantasticall illusions." - Ibid., I, 157.

Indeed not until the discovery of the New World added feathered men with smoke coming out of their mouths, and El Dorado, was there much addition to Pliny's classic family.

WOLF.

To our ancestors, the wolf was a more dreadful enemy than the dragon or the lion - he was ever-present, cunning, powerful and savage. The tradition has been that wolves were exterminated in Britain in the tenth century, but there are scattered references to them long after that. In 1433 one Sir Robert Plumpton was given land as a reward for frightening the wolves of Sherwood Forest. As Douglas has written,

If we laugh at wolf-stories now, it is because we have forgotten what that grey horror, with eyes aflame, meant to our ancestors - how for untold ages it terrorised mankind, leaving a deep scar on lore and literature. 1

There are numberless legends about wolves, the commonest being that their glance causes a man to become speechless (possibly in the old days the sudden appearance of the "grey horror, with eyes a-

1. Op. cit., p. 223.

flame," might well have paralyzed a man with fright), that their young were born blind and had to be protected by the mother from the cannibalistic father, and that they stayed their hunger by eating dirt.

WREN.

The Hortus Sanitatis tells the old story of how the wren became king of birds:

Regulus.....ye wrenne.....is a lytell birde which wolde be king of al byrdes, & the egle wolde be kinge because he was stronge & coude flye hyst.....than sayde the wrenne he yt flieth hyst of us both shalbe kyng. & therewith they began to flee & the wrenne gate him under the winges of the egle and when they ware at the hyst than the wrenne flewe out & sate upon ye hede of the egle & sayd, now arte thou overwonne..... 1

Because of this ancient legend, the lytell wrenne was credited with many magic powers, and in mediaeval Ireland and Scotland hunted and killed on Christmas Day. Precise reason for this persecution is not known. St. Stephen's Day, December 26, used to be called "Wrenning Day" because of the

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1. Op. cit., p. 120. "Regulus", of course, means "king". Hortus also called the wren "trocilus", a common Middle Ages mistake.

custom of stoning a wren to death on that day in commemoration of the Saint's martyrdom.

YALE.

Pliny described this beast as of size equal to the hippopotamus, with jaws like a boar's and long horns which he could "stirre or moove as hee list".¹ Perhaps because the yale's most mythical feature - the ability to move his horns - was not very spectacular, he never achieved much notoriety in the Middle Ages.

YEW.

The fable that the shade of the yew is poisonous was apparently old when Ovid wrote that the pathway to the infernal realms was lined by "deadly yew trees",² and Pliny called the "Yughunpleasant to look upon.....deadly poison..... so venomous, that whosoever take either repose or repast under it are sure to die presently".³

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1. Op. cit., I, 208. It is thought that the yale may have been an ibex.
 2. Metamorphoses, iv, 432.
 3. Op. cit., I, 463 f.

Actually, the yew has poisonous properties, but they are not so mortal as feared, and they are confined to the leaves and berries. It is thought that in Britain yews were first planted in churchyards to provide "palms" for Palm Sunday, and/ or bows for archers.

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CHAPTER IV.

THE FABLES IN LITERATURE BEFORE 1600.

In pre-Conquest Anglo-Saxon literature there is only a modest amount of nature mythology. Beowulf fought with Grendel and his mother, proper monsters both, as well as with "spotted deadly" sea serpents and the final "old twilight-foe, the naked hostile dragon".¹ The poem "Exodus" spoke of people "dark from the sun's heat" and "The Wanderer" lamented the work of giants standing empty.² Bede wrote that heated jet drove away serpents, and some of the old charms and riddles seem to contain in their obscure wording references to nature fables.³ In the Dialogue of Salomon and Saturnus Salomon described a "bird" which "sitteth in the Philistine's middle district" and has "four heads of ordinary men, and he is in the midst of a whale's shape; he hath wings and griffin's feet....."⁴ Salomon also told

1. Gordon, Anglo-Saxon Poetry, pp. 15, 51. Grendel himself had a dragon-skin pouch.
2. Ibid., p. 124. Modern scholars believe that "The Wanderer" was looking at a Roman ruin.
3. Vide the charm "Against a Dwarf" and the riddles "Storm" and "Cuckoo" in Gordon, pp. 96, 322, 324, and the Exeter Book riddle mentioned under "Barnacle Goose" in Chapter Three.
4. The Dialogue of Salomon and Saturnus, pp. 159 f.

Saturnus that Adam was composed of eight pounds of material: a pound of earth "of which his flesh was made", a pound of fire "hence his blood came red and hot", a pound of wind "and thence his breathing", a pound of welkin "thence was his unsteadiness of mood", a pound of grace for his "fat and growth", a pound of blossoms for the "variety of his eyes", a pound of dew "whence he got his sweat", and a pound of salt for his tears; and he, Adam, was "six, and one hundred and ten inches, high," and lived in this world 930 years.¹ Alfred reported no native nature marvels, but in his translations of Bede, Orosius and Boethius he passed on tales of Circe's metamorphoses which made men "prone like beasts.....by baleful craft.....all this druid-craft",² and Hercules' battle with the Amazons, and the Thessalian horsemen which the Lapithae mis-

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1. Ibid., p. 181. For Salomon's estimate of Adam's terms of life in Paradise and hell, see "Longevity" in Chapter Three. The wise Salomon also told his eager pupil that Noë's ark measured 300 by 50 by 30 fathoms and took 80 years to build, and that the sea was salt because of Moses' tears, and that there were 54 kinds of birds and 26 kinds of fish.
 2. The Whole Works of King Alfred the Great, I, 237.

took for centaurs, and Regulus' river-dragon,¹ and the "half man and half lion" minotaur,² and the lynx which "Aristotle the philosopher.....said..... could see through everything, both trees and even stones....." ³

After the Conquest, however, Mediterranean-an fabulous matter as well as the Gallic graceful manner came to England, and literary use of nature marvels increased apace.

In The Mabinogion Peredur met a monster called an "addanc" which lived in a cave and slew people "each day".⁴ Lludd was sore pressed by a demon and a dragon which had been raising a "dire scream", which he overcame by wine.⁵ The faithless

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1. This dragon was 120 feet long and "killed all the men who came near the water.....arrows glided on its scales, as if they were smooth iron," but Regulus ordered up the "balistas, with which they broke walls," and at the "first throw, one of its ribs was broken, so that afterwards it had not power to defend itself, but was soon after killed....." - Alfred's translation of Orosius, ibid., II, 137 f.
 2. Ibid., II, 70.
 3. Ibid., II, 477.
 4. The Mabinogion, p. 210. Peredur thrust the addanc through with his spear and cut off his head.
 5. Ibid., pp. 92 f. Lludd then wrapped the dragon in silk and buried it in "Eryri". This wily hero changed his tactics slightly when he strove with the "Coranieid folk", who heard every sound in England - he poisoned them with mashed insects. - Ibid., p. 91.

flower-maiden Blodeuedd was changed into an owl.¹
The Mabinogion also spoke of a "stag" which might well have been a unicorn - the black maiden asked Peredur to kill a "stag" which had been slaying every animal in the forest and was as "swift as the swiftest bird", with "one horn in its forehead, the length of a spear-shaft.....as sharp of point as aught sharpest-pointed".² Peredur did. The Rule of Anchoresses used animals to symbolize the seven deadly sins, including the "unicorn of wrath".³
 Walter Map, friend of Giraldus Cambrensis and a right marvel-loving Welshman himself, commented on the old Plinian fable of goat's blood dissolving diamonds - "surely.....things of this sort man learneth not in the course of seventy years"⁴ - and other unnatural occurrences involving vampires, pygmies, hybrids, longevity, giants - he reported

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1. Ibid., p. 74. In Welsh "Blodeuedd" may mean "flower-face", apt enough for an owl.
 2. Ibid., p. 225.
 3. Medieval English Verse and Prose, p. 53. The others: the lion of pride, the adder of envy, the bear of sloth, the fox of covetousness, the swine of greed, the scorpion of lust.
 4. De Nugis Curialium, pp. 3 f. Of this same phenomenon, Pliny had asked: ".....whose head devised it first, or rather by what chance was it found out and knowne? What conjecture should lead a man to make an experiment of such a singular & admirable secret?" - Natural History, II, 610.

that a certain queen had vowed that all giants had been killed by Hercules, but to him, Walter Map, "it seemeth impossible that our giants do not groan in the waters beneath the earth" ¹ - prenatal influence, the evil eye, prophetic birds, a dragon ² and a merman named Nicholas Pipe, "who, without breathing, was wont to dwell without any harm a long time, a month or even a year, on the floor of the ocean with the fishes....." ³ The Owl of The Owl and the Nightingale warned the nightingale that ".....I a clever bird am rated,/ And foresee all things that are fated....." ⁴ Gawain on his way to the Green Knight met so many "marvels" that "too tedious were it to tell of the tenth part..... Serpents.....wolves.....wood-trolls.....bears.....giants", and if he had not been "enduring and doughty,"

1. Ibid., p. 15. Llewellyn, said Map, claimed that his ancestors had won all England, Cornwall, Scotland and Wales from giants.
2. Henno cum Dentibus married a pretty lass who turned out to be "a noble pest.....a dragon". He chased her away with holy water. - Ibid., pp. 219 f.
3. Ibid., pp. 232 f. William, King of Sicily, ordered the merman dragged into his presence, but poor Nicholas "died in their hands on account of absence from the sea".
4. Medieval English Verse and Prose, p. 42. The nightingale's damaging reply: ".....thy wondrous sense.....comes.....by sorcery....." - Ibid., p. 43.

and served God,/ These doubtless would often have done him to death." ¹ Piers Plowman declared that of all "biting venoms" that of a scorpion was "vil-est", and added: "No medicine may amend the place where he stingeth,/ Till he be dead and put upon the spot....." ² Piers also spoke of "fiends and fiendlings", and his Lord likened Lucifer to a "lizard with a ladys face". ³ The Pearl poet, speaking of the Virgin Mary, said: "We call her the Phoenix of Araby,/ That flies in faultless charm arrayed....." ⁴

Those most popular pre-Chaucerian writings, The Romance of the Rose, Reynard the Fox, The Golden Legend and the matters of Arthur and Roland, were comparatively free of pseudodoxia naturalis. The Rose poets in their sophisticated way made use of monsters and marvels to brighten their imagery, but usually with tongue in cheek. The old harri-dan guarding Fair-Welcome was "as adder deaf.....to

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1. Ibid., p. 174.
 2. The Vision of Piers Plowman, pp. 155 f. Belief in sympathetic magic began long before Pliny and persisted long after the Royal Society so solemnly investigated it in the seventeenth century - q.v. infra.
 3. Ibid., pp. 164, 163.
 4. Medieval English Verse and Prose, p. 226.

heed.....softest word or kindest look"; ardent
 true-love left the world when "the old Gods fled/
 By giants overmastered"; Dame Fortune stumbled a-
 round her "bright and drear" glorious-mud palace
 "as a blind-worm nude"; a virtuous woman was

.....more rare
 Than is a phoenix? Nay
 'Twere apter simile to say
 Rarer by far than snow-white crow..... ;

a woman with the most fashionable thirteenth-cen-
 tury hair-do wore

.....such horns
 As neither stags or unicorns
 Could boast if they should dare to plight
 Themselves with her in deadly fight.

They were less flippant towards giants, satyrs,
 sirens, lions, hydras and the lynx, and towards
 sea-monsters they - or rather de Meun - showed
 respect: upon leaving Mirth's garden one sees

...all the world.....in its immensity,
 And all its riches from of old,
 And wealth of wonders manifold;
 And he should see the unknown deep,
 And fishes that free revels keep
 In bitter waters, and the strange
 Great beasts that ocean's caverns range...¹

1. The Romance of the Rose, II, 4107 ff., 5689 ff.,
 6496, 9113 ff., 14009 ff., 21173 ff.

Reynard, as stated in Chapter Three (under "Fox"), credited its hero with the legendary ability to feign death and thus entrap the unwary, but was otherwise more cynical than the Rose. The Golden Legend occupied itself with super- rather than unnatural marvels. The Legend did, however, dwell lovingly on the saga of St. George and the dragon, making of that worm such a villain, and of the pre-fourth century martyr such a hero, that in the fourteenth century when the Order of the Garter was founded, George was made patron saint of England. Arthur and Roland stories began by matching knight against knight, usually, with little time left over for introduction of fabulous beasts. Arthur's Yvain did find time to rescue a lion from a serpent, whereupon the lion demonstrated the expected lordly gratitude; Perceval attracted to Carlion a loathly damsel who verged on hybridity, for

.....if the book tells the truth, her tresses, neck, and hands were black; she had rat's eyes, a nose like that of a monkey or a cat, yellow teeth, a goat's beard, a hump on both chest and back, and crooked legs, 1

and Sir Marrok, "the good knight," was "betrayed

1. Arthurian Tradition and Chrétien de Troyes, pp. 415 f.

with his wife, for she made him seven year a were wolf".¹ Roland and his men encountered some sorcery, and Charlemagne was credited with more than 200 years of life, but the most fabulous Rolandic adventure took place in the head of Charles - he had a dream, after the death of Roland, in which he saw "all his knights in great distress", attacked by

.....bears and leopards, serpents and vipers, dragons and demons.....griffins too, more than thirty thousand of them..... And the French cry: 'Charlemaine, help us!' The king is filled with grief and pity; he wishes to go to them, but something prevents him. Forth from a wood comes a huge lion, evil and fierce and proud; it leaps up and attacks the emperor himself and they meet in close embrace.....but the emperor knows not which will vanquish and which will fall, and he has not yet awakened from his sleep..... 2

Chaucer drew very largely from Mediterranean sources for his imagery as well as his plots,

1. Le Morte d'Arthur, II, 335. Arthur's sorceress-sister Morgan was notorious for her herb-skill, and among the legends concerning what happened to the King after his death - that he went to Avalon, or Mount Aetna, or the Welsh hills, or to lead the Wild Hunt on the slopes of the Mont du Chat - was a story that he became ruler of the Pygmy people of the Antipodes.
2. The Song of Roland, pp. 88 f. Result of the dream-battle was not revealed.

and was particularly indebted to the twelfth century Latin poet Alain de L'Isle for his bird lore. (Alain in turn had picked up most of his ornithology from Virgil, Ovid and Pliny.) In his lesser poems, Chaucer spoke of

.....meremaicens of the see,
That for hir singen is so clere:
Though we meremaicens clepe hem here.....
Men clepe hem sereins in Fraunce, 1

"the scorpiowne,/ That is a false flattering beest" and "The solein fenix of Arabie,"² as well as the royal eagle "That with his sharpe looke perseth the Son" and the "jelous swan, ayenst his deth that singeth" and the death-boding owl and the "false lapwing, full of trecherie".³ In "The Legend of Good Women" the poet wrote again of the singing swan and of "Duke Jason" and his troubles with "a dragoun,/ And many other mervailles up and down," and of Ariadne's minotaur, that "wicked best".⁴

1. The Poetical Works of Geoffrey Chaucer, "The Romaunt of the Rose", II, 680 ff.
2. Ibid., "The Booke of the Dutchesse", II, 636 f., 983.
3. Ibid., "The Assembly of Poules", II, 331, 342, 347. The lapwing was thought to be deceitful, because of its trick of trying to lure passers-away from its nest, and dirty, because of its eating habits.
4. Ibid., "The Legend of Good Women", II, 1364, 1426 f., 1924.

In The Canterbury Tales, Chaucer made liberal use of nature fables. "Licurge himself, the grete king of Trace," was black of beard, manly of face, "yelwe and red" of eye, and "like a griffon loked he about".¹ In "The Man of Lawes Tale," (II, 4824 ff.),

.....this scorpion, this wicked gost,
The Soudanesse, for all hire flattering
Cast under this ful mortally to sting.

"The Prioresses Tale" is based on the old legend that the blood of a murdered man reveals the murderer. When the Alma redemptoris-singing "litel child" is killed by the Jews, "Mordre wol out..... The blood out crieth on your cursed dede," and the murderers are detected and drawn by horses.² Chaucer's own parody-knight, Sir Thopas, prepared for his combat with the three-headed "gret geaunt..... Sir Oliphaunt" by devouring, among other dainties, "swete win.....and real spicerie,/ Of gingerbred"³ The Monk told of Hercules "the soveraine

1. Ibid., "The Knightes Tale", II, 2131 ff.
2. Ibid., "The Prioresses Tale", passim. After the malefactors had been drawn, the provost "heng hem by the lawe".
3. Ibid., "The Rime of Sire Thopas", passim. Our host interrupted Chaucer - "No more of this for Goddes dignitie" - before it was revealed whether a diet of swete win and gingerbred was sufficient for the immediate needs of Sir T., that "flour of real chevalrie".

conquerour" who

...of Centaures laid the bost adoun;
 He Harpies slow, the cruel briddes felle;
 He golden apples raft fro the dragon;
 He drow out Cerberus the hound of helle.....

He "slow the firy serpent venemous.....slow the
 geaunt Anteus," and indeed "was never wight sith
 that the world began,/ That slow so many monstres,
 as did he".¹ "Chaunteclere", in the beast-fable,
 "sang merier than the Mermaid in the see".² The
 Wife of Bath's fifth husband, "joly clerk Jankin",
 used to say to her that a man should rather live
 "with a leon, or a foule dragon,/ Than with a woman
 using for to chide".³ The fabulous "stede of bras"
 of "The Squieres Tale", "so horsly, and so quik of
 eye," was so fleet that men "sayd it was ylike the

-
1. Ibid., "The Monkes Tale", II, 14102 ff. "Bost" meant pride or boasting. In telling of the death of "worthy mighty Hercules" at the hands of his wife Deianire, "fresh as May," and "on, that highte Nessus", the Monk did not point out that Nessus was a centaur.
 2. Ibid., "The Nonnes Preestes Tale", II, 15274 f. "For Phisiologus sayth sikerly,/ How that they singen wel and merily". Chaunteclere sang so merily just before dan Russel the fox seized him.
 3. Ibid., "The Wif of Bathes Prologue", II, 6210, 6358 f.

the Pegasee,/ The hors that hadde winges for to flee....." ¹ In "The Chanones Yemannes Tale", that roguish alchemical forerunner of Subtle explained that when Hermes, father of "philosophres", said "how that the dragon douteless/ Ne dieth not, but that if he be slain/ With his brother," he meant "By the dragon Mercury, and non other,/.....and brimstone by his brother".² But the "Person" spoke of a more serious dragon, reminding the company of the plight of the evil when "the gall of the dragon shal ben hir drinke, and the venime of the dragon hir morsels".³ The "Person" in his sermon against the "stinking sinne of lecherie" said that the "first fingre" the devil used to "cacche the peple to his vilanie" was the "foole looking of the foole woman and of the foole man, that sleth right as the Basilicok sleth folk by venime of his sight". The second "fingre" was

.....the vilains touching in wicked maner.
And therefore sayth Salomon, that who so

-
1. Ibid., "The Squieres Tale", II, 10429, 10508, 10521 f.
 2. Ibid., "The Chanones Yemannes Tale", II, 16902 ff. For a further note on alchemy, see Chapter Five, discussion of Newton.
 3. Ibid., "The Persones Tale", p. 150.

toucheth and handleth a woman, he fareth as
the man that handleth the scorpion, which
stingeth and sodenly sleth thurgh (sic) his
enveniming..... 1

The fifteenth century "Gesta Romanorum"
told of a damsel who was swallowed by a whale.

And when the maid felt that she was
in the belly of a whale, she smote, and
made a great fire (the whale had also swal-
lowed the ship she was in), and so grievous-
ly wounded the whale with a little knife
that he drew to the land and died, for that
is his nature, to draw to the land when he
shall die. 2

The "Gesta" also told of a Roman Emperor who saw a
man being chased by a unicorn. The man climbed a
tree, and saw at its foot "a hideous pit and a hor-
rible dragon lying therein", two beasts, one white,
the other black, gnawing at the tree "so much that
the wretched man felt it wag," and four frogs
"which with their venomous breath envenomed all the
ditch". A friend came by with a ladder and would
have rescued him except that he ate so much of the

-
1. Ibid., p. 166. The "basilicok" was the
basilisk or cockatrice. The remaining three
fingres of the devil's hand were, in order,
"foule wordes", "kissing", and "the stinking
dede....."
 2. Medieval Verse and Prose, p. 387.

honey that was on the branches of the tree that he
 "fell down into the mouth of the dragon....."

Morality: "Dear Friends, this Emperor is
 to be understood as Jesu Christ, who.....be-
 holdeth a man, scil., secrets of the heart.
 The man that fleeth is a sinner; the uni-
 corn is death..... This ditch is the world;
 the tree.....is the life of man.....the two
 beasts.....night and day..... The four
 frogs.....humors..... The dragon is the
 devil; the pit is hell; the sweetness is
 delight in sin.....the friend.....is Christ
 or a preacher.....the ladder is penance". 1

"La Male Regle" mentioned a mermaid who sang to and
 then devoured sailors; "From all such song it is
 good that men keep themselves....." 2 "The King's
 Quair" sang of

Beasts.....of many a diverse kind:
 The lion king.....
 the panther, like unto the smaragdine.....
 the lazy ass.....the foolish ape.....
 the sharp-eyed lynx; the lover unicorn,
 That drives out poison with his ivory horn. 3

Robert Henryson was a nature lover. He
 believed that

...thocht brutall beistis be Irrationall,

-
1. Ibid., p. 379 f.
 2. Ibid., p. 348.
 3. Ibid., p. 368. The "smaragdine" had cat's
 head, bear's body, long striped tail, and, of-
 ten, human hands. "Smaragd" was emerald.

the Sparth.....The peyntit Pantheir, and
 the.....wyld Once.....the Bowranbane.....
 the marmisset the Moudewart couth leid,
 Because that Nature denyit had his sicht.....
 And mony kynd off beistis I couth not know... 1

In another fable the fox, or "Tod" or "Reynard" or "Russell" or "Lowrence", is in league with the wolf. They see a cadger carrying some herrings. The fox feigns death, the cadger puts him into his creel and takes him along, the fox throws the herrings to the wolf. Finally the fox jumps off and tells the wolf that the best herring is still in the creel. The wolf feigns death, the cadger comes and beats him nearly to death, and the wily tod takes all the herrings into his den, having "betraisit his Maister and the man".² Henryson's telling of the Orpheus

1. Ibid., pp. 30 ff. The "sparth" and "bowranbane" are unidentified. There was a common belief, which still persists, that the moldwarp, or mole, was blind. As every gardener knows, he is not.
2. Ibid., p. 68. The editor notes: "The source of this fable, one of Henryson's best, is yet unknown, but Professor Bruce Dickins suggests that it may be an elaboration of the Bestiary story of the Fox feigning death in order to catch carrion-crows or ravens." A more likely explanation would seem to be that Henryson got the idea for the fable from an incident in Fytte I of Reynard the Fox: Greybeard the Badger tells King Noble how Isengrim and Reynard once saw a man carrying fish in a cart - Reynard "dropt as dead - the man of fish" put him on the cart - he tossed over the fish to Isengrim, who ate them all and left poor Reynard "not a fin".

and Eurydice story is particularly charming. After "Ewridicess" was "with the phary tane", "Orpheouss" played, and the "treis dansit with thair leves grene". Even his music was surpassed, however.

In his passage amang the planeitis all,
he hard a hevenly melody and sound,
passing all instrumentis musicall,
causit be rollyn of the speiris round.

In hell he found "a porter fell,/ with thre heidiscallit serberus.....a monstour mervellus," and there he also saw "titius.....and on his breist thair sat a grisly grip,/ quhilk with his bill" tore poor Tityus. Orpheus "maid sueit melody - / The grip is fled....." ¹ and the great musician saw, but only saw, his "Ewridicess" once more. In another fable Henryson told of the origin of centaurs: "exione" tried to lie with Juno, but she "a rany clud.....kest betwix thame two;/ and in that clud his nature yeid him fro,/ off quhilk was generat the sentowriss,/ half man, half horse, upoun a ferly wise".² Henryson doomed Cresseid's "Corps and Carloun/ With Wormis and with Taidis to be rent,"

-
1. Ibid., pp. 134 ff. A "grip" was a vulture, or a griffin.
 2. Ibid., pp. 144 f.

and in the "Ressoning Betwix Deth and Man" death calls upon man to "Dispone thy self and cum with me in hy,/ Edderis, askis, and wormis meit for to be....." ¹ This poet's "The Bludy Serk" is a model of colourful and brief giantological narration:

This hindir yeir.....Thair was a worthy King
he had a dochter fair.....a Lusty Lady
 ying,....A fowll gyane
 away with hir is gane,
 and kest hir in his dungering,
 Quhair licht scho nicht se nane;
 hungir and cauld and grit thirsting
 Scho fand in to hir wame.
 He was the laithliest on to luk
 That on the ground mycht gang;
 His naillis wes lyk ane hellis cruk,
 Thairwith fyve quarteris lang,
 Thair wes nane that he ourtuk,
 In ryght or yit in wrang,
 Bot all in schondir he thame schuke -
 The Gyane wes so strang.
 He held the lady day and nycht,
 for gold nor yit ransoun,
 Bot gif the King mycht get a knyght,
 To fecht with his persoun.....
 a worthy prince that had no peir
 hes tane the deid on hand.....
 and fawcht with him his awin persoun,
 and tuke him presoneir;
 And kest him In his awin dungeoun,
 allane withouttin feir,
 With hungir, cauld, and confusioun,
 As full weill worthy weir.....(but)
 Sa evill wondit was the knyght
 That he behuvit to de.....

(the lusty lady kept his bloody shirt, and)

1. Ibid., pp. 125, 212. "Taidis" were toads,
 "Edderis, askis" were adders, newts.

no man wald scho tak.....

MORALITAS:

This King is lyk the trinitie.....

the manis soule to the Lady;

The gyane to Lucifer;

The Knycht to Chryst, that deit on tre....¹

In the first half of the sixteenth century Elyot wrote of the fox's fraud and Plinian caprimulgi and wound-healing dittany. More avoided pseudodoxia naturalis, admitting no Utopian animals into Utopia, but "angry Skelton's breathless rhymes" made mention of mantichoras.² As the Renaissance spirit boiled up, men's love of nature marvels, and their literary use of them, increased apace. Wyatt wrote of cat eyes so hot they steamed; Surrey anticipated Butler's Feminin' Monarchi' in placing a queen above the marvellously ordered bees; Tusser dealt with witches and the infectiousness of the south wind; Gascoigne wrote of Titan and other monsters; Sackville featured Cerberus, and snaky hair; Oxford widened his scope to include Pan himself, and Breton passed on the traditional concept

1. Ibid., pp. 173 ff.

2. "Phyllyp Sparowe": "mantycoras". Bishop Hall in Virgidemiarum, lib. vi, sat. 1, coined the accurate description of the Skeltoniads.

of subtle Reynard.

The Elizabethans brought nature fabling to its all-time height of flexibility and popularity. Nashe, Ascham, Deloney, Eliot, Raleigh, Purchas, Hakluyt, Watson, Gifford, Constable, Chapman, Campion, Dekker, Barnfield, Roby, Gosson, Hooker, North - these and all the others of the "singing birds" sang of the old mermaids and giants and unicorns as well as the new birds of paradise and dead-ly upas trees and vampire bats. Marlowe, for instance, in his relatively small output used fables involving dolphin, halcyon, raven, serpent, dove, basilisk, partridge, poison, mandrake, crocodile and others. Kyd, in the stark "Spanish Tragedy", spoke of the thorn-pricked nightingale, and the chimera; Ford decorated his "'Tis Pity She's a Whore" with fabulous references to the dove, the hydra, coral and hydrophobia; Massinger used such fables of cormorant, coral, ambergris, amber, wolf and basilisk in his "New Way to Pay Old Debts", and Webster's tragic "Duchess of Malfi" contained some twenty references to fabulous stories concerning creatures ranging in strangeness from Pegasus, basilisk and werewolf down to the humble mare impregna-

ted by the west wind. Beaumont and Fletcher made particular use of fables of goat, crocodile, tiger, amber, dragon, spider, moon, pygmy, Amazon. Poor dying Greene in his "Repentance of Robert Greene Master of Arts" warned his fellow-roisterers against harlots, those "basilisks that kill with their eyessirens that allure with their sweet looks," and an anonymous lyric, "The Silver Swan", purported to give the words of the famous swan-song:

The silver swan, who living had no note,
When death approached unlocked her silent
throat;
Leaning her breast against the reedy shore,
Thus sung her first and last, and sung no more:
"Farewell, all joys, O death, come close mine
eyes;
More geese than swans now live, more fools
than wise." 1

Suckling wrote a whole play, not too unamusing, about a band of thieves masquerading as goblins. Sidney fabled about vipers, monsters, crocodiles, lions, doves, peacocks, the phoenix and so on. Drayton's "Nymphidia" was of course a catalogue of nature legends, and one might say that Euphues could have been subtitled Pliny Revisited; it was

1. Elizabethan Verse and Prose, pp. 142, 39.

practically held together by the classic fables. Rare Ben Jonson in his careful scholarly fashion used a host of the old legends, as well as a sprinkling of the new - in "Every Man in His Humour", for instance, he refers to the omnivorous propensities of the ostrich. Spenser, second greatest of the Elizabethans, was saturated with nature mythology. In "Mother Hubberds Tale" the Ape, "strongly encorag'd by the crafty Foxe," assembled a "warlike equipage of ferreine beasts.....Griffons, Minotaures, Crocodiles, Dragons, Beavers, and Centaures....." ¹ In the October "Aegloga" of "The Shepherds Calendar" Cuddie complained that Colin, "were he not with love so ill bedight,/ Would mount as high and sing as soote as swanne".² In sonnet XLIX of the "Amoretti" series the lover admonished his "Fayre Cruell"

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1. The Works of Edmund Spenser, p. 429. (Lines 1104 ff.)
 2. Ibid., p. 389. In the "Glosse" the author explains that although the swan "hath ever woonne small commendation for her sweete singing..... it is said of the learned, that the Swanne, a little before her death, singeth most pleasantly, as prophecying by a secrete instinct her meere destinie....." In the "Glosse" to the June eclogue Spenser made his famous etymological dictum that the Italian "Factions of the Guelfes and the Gibelyns" gave to the English language the words "Elfes and Goblens".

to flash her "imperious eyes.....not on him that never thought you ill, but.....

against your enemyes:
Let them feel the utmost of your cruelties;
And kill with looks, as cockatrices do....."

Spenser's description of the death of the phoenix, in "The Visions of Petrarch", v, is most homely and touching:

I saw a Phoenix in the wood alone,
With purple wings, and crest of golden hewe;
Strange bird he was, whereby I thought anone,
That of some heavenly wight I had the vewe;
Untill he came unto the broken tree,
And to the spring.....
What say I more? each thing at last we see
Doth passe away: the Phoenix there alas,
Spying the tree destroid, the water dride,
Himselfe smote with his beake, as in disdaine,
And so fourthwith in great despight he dide.....

In The Faerie Queene appear a host of fabulous creatures, including the "cruell craftie crocodile,/ Which in false griefe hyding his harmefull guile,/ Doth weepe full sore....." until the unwary traveller pities him and is "swallowed up unwares"; the "prowd rebellious unicorn"; the music-loving dolphin; the "warlike Amazons" who "doe possesse" the river which bears their name; the courteous virgin-sparing lion; the loathly giant "ryding upon a

dromedare on hie" which "secretly his enemies did slay: Like as the basiliske....."; "ten thousand kindes" of mud-born ugly monsters of the "fertile Nile, which creatures new doth frame," and Guyon's "hideous hoast" of

.....huge sea-monsters.....spring-headed
hydras.....sea-shouldring whales; great
whirlepooles.....bright scolopendraes.....
mighty monoceros.....the dreadful fish, that
hath deserv'd the name of Death.....griesly
wasserman.....horrible sea-satyrs.....huge
ziffius.....greedy rosmarines with visages
deforme.....all these, and thousand thousands
many more..... 1

Spenser's account of the excitement of the neighbours after the Red Cross Knight killed the dragon, and what happened after "the raskall many ran..... and came where that dead Dragon lay.....", is as detailed and factual as a newspaper account:

Some feard, and fledd; some feard, and well it
faynd;

-
1. Ibid., "F.Q.": I, v, 18; II, v, 10; IV, xi, 21; IV, viii, 39; I, i, 21; IV, xi, 20; II, xii, 23 ff. "Whirlepooles" were sperm whales. "Scolopendraes" were probably centipede-like sea creatures. "Monoceros" was the "sea unicorn". (Narwhal?) The "Death" fish was a sea monster described by earlier writers as "Mors". (Morse, or walrus?) "Wasserman" was Gesner's "Homo marinus". "Ziffius" was the sword-fish, Xiphias. "Rosmarines" were walruses.

One, that would wiser seeme than all the rest,
 Warnd him not touch, for yet perhaps remaynd
 Some lingring life within his hollow brest,
 Or in his wombe might lurke some hidden nest
 Of many dragonettes, his fruitful seede;
 Another saide, that in his eyes did rest
 Yet sparckling fyre, and badd thereof take heed;
 Another said, he saw him move his eyes indeed.

One mother, whenas her foolehardy chylde
 Did come too neare, and with his talents play,
 Halfe dead through feare, her litle babe revyld,
 And to her gossibs gan in counsell say:
 "How can I tell, but that his talents may
 Yet scratch my sonne, or rend his tender hand?"
 So diversly themselves in vaine they fray;
 Whiles some more bold to measure him nigh stand,
 To prove how many acres he did spred of land. 1

It is in Shakespeare, however, that we find the most abundant, colourful and diverse use of the elements of fabulous natural history. The fables were especially well suited to imagery, hot or cold, delicate or profound, dark or light, and the great image-master exploited them to the very height and limit of his - and their - bent. In all, Shakespeare used nearly 600 references to some 170-odd nature fables. Not one of his plays is without such a reference. Cymbeline and Othello each contain more than 30 references to fables.

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1. Ibid., "F.Q.", I, xii, 9 ff. Spenser did not record the dragon's area.

Macbeth, if one should choose to count each separate ingredient of the witches' broth, would total nearly 40! The poet used practically every fable listed in Chapter Three, and a great many besides.

One Chapter Three fable that Shakespeare did not use was the "bird-of-paradise-has-no-feet". One of the fables which he used for which there was not space for discussion in Chapter Three was the odd notion that the fate of old maids was to lead apes in hell. He referred to this legend in The Taming of the Shrew, II, 1, and again in Much Ado About Nothing, II, 1, where Beatrice says that rather than take him "that is lesse then a man.....I will euen take sixepence in earnest of the Berrord, and leade his Apes into hell".¹ Sometimes Shake-

-
1. Furness' Variorum states that "Berrord" was probably a "bear-ward" or "bear-herd", and that "to lead apes in hell" was a very ancient phrase of untraceable origin indicating posthumous retribution for an unmarried woman. In Shakespeare's time bear-wards also led apes, and - according to Halliwell - there was a parallel legend that old bachelors led bears in hell. Furness concludes that the phrase "to lead apes in hell" had for Elizabethans become "one of those phrases, like Hamlet's 'hawk from a handsaw', where words which had become obsolete.....were replaced by others which were familiar, but so inappropriate as to obscure wholly the original meaning of the proverb". - Variorum, Much Ado About Nothing, p. 61.

Gloucester, II Henry VI, III, 2, the King says,

What, doth my Lord of Suffolk comfort me?.....
 Lay not thy hands on me; forbear, I say!
 Their touch affrights me as a serpent's sting....
 Upon thy eye-balls murderous tyranny
 Sits in grim majesty.....
 Look not upon me, for thine eyes are wounding.
 Yet do not go away. Come, basilisk,
 And kill the innocent gazer with thy sight.....,

and when the Queen taunts Suffolk - "Fie, coward
 woman and soft-hearted wretch!/ Hast thou not spirit
 to curse thine enemy?" - that vengeful man roars
 out:

A plague upon them! Wherefore should I curse
 them?
 Would curses kill, as doth the mandrake's groan,
 I would invent as bitter searching terms,
 As curst, as harsh and horrible to hear.....
 As lean-faced Envy in her loathsome cave.
Poison be their drink!
 Gall, worse than gall, the daintiest that they
 taste!
 Their sweetest shade a grove of cypress trees!
 Their chiefest prospect murd'ring basilisks!
 Their softest touch as smart as lizards' stings...

and so on until even the gentle Queen is forced to
 cry, "Enough, sweet Suffolk!" Shakespeare used
pseudodoxia naturalis to heighten the ghastliness
 of the horrid scene in Richard III (I, 2) when
 Richard halts the coffin of Henry VI and Anne cries
 out,

Thou common whore of mankind.....", apostrophising
the

.....Common mother, thou
Whose womb immeasurable and infinite breast
Teems and feeds all; whose self-same mettle,
Whereof thy proud child, arrogant man, is puff'd,
Engenders the black toad and adder blue,
The gilded newt and eyeless venom'd worm,
With all the abhorr'd births below crisp heaven...

(Timon of Athens, IV, 3). He used the fables to
make pretty things prettier. As Bassanio contem-
plates the caskets, Portia says,

.....I am locked in one of them;
If you do love me, you will find me out.
Nerissa and the rest, stand all aloof.
Let music sound while he doth make his choice;
Then, if he lose, he makes a swan-like end,
Fading in music.

(The Merchant of Venice, III, 2.) By using the
same swan-song legend, he made the solemn more sol-
emn. As King John lies dying, Pembroke comes to
Prince Henry and reports: "He is more patient/ Than
when you left him; even now he sung," and the
Prince says,

O vanity of sickness! fierce extremes
In their continuance will not feel themselves.
Death, having prey'd upon the outward parts,
Leaves them insensible; and his siege is now

Those eighteen dragons are far from the same. Indeed, some of them hardly seem to be even cousins of others. They perform all sorts of poetical tasks. In Midsummer Night's Dream, III, 2, when Oberon gives Puck his instructions for a full night's work, Robin replies to the "king of shadows" matter-of-factly,

There is a difference between a grub and a butterfly; yet your butterfly was a grub. This Marcius is grown from man to dragon; he has wings; he's more than a creeping thing.

And what an instant image of dark power is conjured up when Lear thunders, "Peace, Kent! Come not between the dragon and his wrath." 1

Or consider Shakespeare's Centaurs. In A Midsummer Night's Dream, V, 1, when Theseus' "usual manager of mirth" offers as entertainment "The battle with the Centaurs, to be sung/ By an Athenian eunuch to the harp", the sage ruler replies briefly, "We'll none of that....." But when poor mad Lear rails out against adulterous women, he cries,

The fitchew nor the soiled horse goes to't
With a more riotous appetite.

-
1. King Lear, I, 1. It is significant that after this reference to the mighty but in his fashion honest dragon the nature imagery of Lear proceeds through Cuckoo, Sea-monster, Wagtail, Halcyon, Serpent to voracious Pelican, the foul fiend Flibbertigibbet, the haunted nightingale and the savage Tiger, Monsters of the Deep, dog-hearted daughters, the Giant of madness, stinging Adder and loathsome Toad.

Down from the waist they are Centaurs,
 Though women all above;
 But to the girdle do the gods inherit,
 Beneath is all the fiends'..... 1

and in Titus Andronicus, after Chiron and Demetrius
 have been seized, "Re-enter Titus with a knife"
 and speaks:

Come, come, Lavinia; look, thy foes are bound,
 Sirs, stop their mouths, let them not speak to
 me,
 But let them hear what fearful words I utter.
 O villains.....
 Here stands the spring whom you have stain'd
 with mud.....
 You killed her husband, and for that vile fault
 Two of her brothers were condemn'd to death,
 My hand cut off and made a merry jest;
 Both her sweet hands, her tongue, and that more
 dear...
 Hark, wretches! how I mean to martyr you.
 This one hand yet is left to cut your throats,
 Whiles that Lavinia 'tween her stumps doth hold
 The basin.....
 You know your mother means to feast with me.....
 Hark, villains! I will grind your bones to dust,
 And with your blood and it I'll make a paste;
 And of the paste a coffin I will rear
 And make two pasties of your shameful heads.....
 This is the feast that I have bid her to,.....
 For worse than Philomel you us'd my daughter,
 And worse than Progne will I be reveng'd.
 And now prepare your throats. Lavinia, come,

-
1. Ibid., IV, 6. Many creatures - notably
 goats and partridges - were supposed to be
 unduly luxurious. Lear speaks of wren and
 "gilded fly" as well as fitchew (pole-cat)
 and horse.

Receive the blood.....
 Come, come, be every one officious
 To make this banquet, which I wish may prove
 More stern and bloody than the Centaurs' feast. 1

But one could spend a lifetime poking
 about in the vast storehouse of Shakespearean
 nature mythology. Suffice it to say that Eliza-
 bethan use of the fables was wide, and deep. And
 brief.

-O-O-

-
1. Titus Andronicus, V, 2. Progne, or Procne,
 after Tereus had ravished Philomel and cut
 out her tongue, killed their son Itys and
 cooked him and served him to Tereus. The
 "Centaurs' feast" took place at a wedding
 to which the Thessalian hybrids had been in-
 vited. They behaved so badly that the
 Lapithae (and in some stories, Hercules)
 fell upon them and drove them out of the
 country.

CHAPTER V.SEVENTEENTH CENTURY ENGLAND,
AND THE ROYAL SOCIETY.

The Elizabethans sang beautifully of mythical mermaids and monsters, beautifully enough to draw dolphins from farthest seas. But the song was short; it was, in fact, for mermaids and monsters and music-loving dolphins, the swan-song. The worm was in the rose. The same spirit of wonder that so glorified the old fables doomed them, for with the Renaissance delight in knowledge came desire to know more, to investigate. And investigation was fatal to nature fables.

Many factors caused the Renaissance scepticism which boiled over after Elizabeth's reign. The Reformation, the rise of capitalism, the printing press, the inflow of Greek manuscripts made available by the Constantinople scholars; reports from the voyages; the findings of Harvey, Gilbert, and Copernicus, attacking traditional views of microcosm, cosmos and macrocosm respectively; the writings of Descartes - all these were among the influences causing men to think, and to question. In

the early seventeenth century, there was stirring a general spirit of restlessness and curiosity. The last years of Shakespeare's life, begun in the golden glory of a Virgin Queen likened to the phoenix and all the grey-eyed goddesses of Greek mythology, were passed in the dubious days of a king who barely believed in witches.¹ "Change and decay in all around I see," as Lyte sang later, best expressed the solemn thought of that post-Renaissance world so convinced of the general falling-off and decline of mankind. The spirit of wonder was giving way to the spirit of doubt.

Doubt did not destroy nature fables all at once, of course. Many false beliefs survived the first waves of scepticism. In June, 1609, King James brought his family and his nobles to the Tower to see a criminal bear, which had killed a child, put in a cage with a lion. The resulting action, a demonstration of rightful use of power by the king of beasts, was intended to be an object lesson to the nobles, with an obvious parallel to human affairs to be considered. The resulting action was

1. In 1616, the year of the death of Shakespeare and Cervantes, Harvey began his lectures on the circulation of the blood.

not to the King's taste:

Medieval natural history guaranteed that the bear's end would be speedy: in fact, as any naturalist would have known, the lion put his tail between his legs and bolted into a corner to which his victim hardly bothered to follow him. Finally all the lions available were tested: not one showed the slightest sign of royalty. 1

But the lion remained, in popular estimation, king for a' that. Lesser subjects of the lion's legendary kingdom of nature mythology were immediately doomed, however, and ultimately the lion-king himself, by the new spirit of doubt. Nature fables were often disprovable by direct investigation, and such investigation came with a rush, once the tradition of the sanctity of "authority" was broken, and men felt free to observe and make original deductions. Medieval men had been caught in the "curious paradox" which Canon Raven describes thus:

On the one side.....a complete and ordered system of deductive and explanatory lore, giving an interpretation of the universe in terms derived from a dogmatic theology and elaborated into a vast and intricate symbolism which gave significance to every phenomenon and sanction to every rule of life. It was

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1. Raven, *Synthetic Philosophy in the Seventeenth Century*, pp. 11 f.

theoretically complete, logically exact and ethically edifying..... Unfortunately it bore little resemblance to reality, and its acceptance came to depend more and more upon the maintenance of ignorance and credulity by means of the distortion of evidence and the suppression of inquiry. On the other hand, there was the native and naive response of mankind to the beauty and interest of his environment, a response stimulated by the need to understand the true character of plant or beast since life and health depended upon such knowledge. 1

Renaissance curiosity began to dissolve the paradox, and in the early seventeenth century direct investigation began slaughtering the fables. Perhaps even greater damage was done to them indirectly, however: the whole vast structure of medieval belief was under attack at a score of points, and since this structure was a unity builded on faith, destruction of any part affected the whole, by weakening faith. Thus the entire body was threatened - and nature fables, a small section of the huge corpus, became a minor and early casualty of a great revolution. The spirit of doubt crippled many of them before actual disproof delivered the final blow. When John Donne comfortably cried that the "new Philosophy

1. Raven, English Naturalists from Neckham to Ray, pp. 30 f.

calls all in doubt" ¹ he was grieving specifically for the old geocentric cosmogony, but "all" was in fact in peril. The new philosophy - science - like the wind of John blew where it listed, and rarely did it touch without withering. In the first half of the seventeenth century a scattering of nature fables came under the general sceptical scrutiny typified by the listings and comments of Browne; in the last half of that century, like sheep in a slaughter-house, nearly all the survivors were led forth to the throat-cutting. And the chief throat-cutter was the Royal Society, as will now be demonstrated.

In the early years of the century the burgeoning spirit of inquiry had been shaped and strengthened by Francis Bacon. Bacon was not a flawless scientist - he spoke seriously of basilisks and air-fed chameleons and fire-quenching salamanders ² and weeping crocodiles and footless birds of paradise and spontaneous generation - but he was a

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1. Donne, "An Anatomie of the World", l. 205.
 2. In his Natural History, Cent. IX, sec. 9, Bacon wrote "if ancient received tradition.....be true" then the fire-proof salamander "must have two things.....a very close skin," and "some extreme cold and quenching virtue in the body".

cogent writer, and he exerted enormous influence in stimulating others to scientific endeavour. In the 1640's a group of surpassingly able Baconian disciples began meeting in Oxford and in Gresham College, London, to discuss all things save politics and religion.¹ In 1662 they were formally established as "The Royal Society", and the stage was set for completion of the metamorphosis of medieval world into modern. That the whole great medieval structure of belief was in peril was patent; it remains to show that the acts and influence of the Royal Society helped to deal the coup de grâce to that structure and in particular to the portion of it concerned with nature fables. For this, it is necessary to examine the deliberations of the Society directly touching nature fables, but first the influence of the Society and its members must be discussed. For the Society's interest was great in the seventeenth century, and general interest in its transactions was keen, and so its transactions were

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1. "Our business" precluded only "Matters of Theology and State Affairs," wrote one founder, John Wallis. (Letter cited in Notes and Records of the Royal Society, Vol. 5, No. 2, pp. 65 f.) Sprat said the Society's purpose was "the satisfaction of breathing a freer air and conversing in quiet, without being engaged in the passions and madness of that dismal Age". (Sprat, History of the Royal Society, p. 53.

more important in destroying faith in the old beliefs than might now seem apparent.

The early Royal Society held an extraordinary array of genius. Among its members for the years 1662-1700 were Isaac Newton and his German counterpart, Leibnitz; Christopher Wren; John Locke; Dryden, Denham, Waller, Sprat, Glanvill; Pepys, Evelyn, Aubrey; Halley, Hooke, Boyle, Huygens, Leeuwenhoeck, Malpighius, Mayow, Lister, Flamsteed, Glisson, Vossius, Lower, Ray, Haak and Hevelius. The Society included the outstanding men of art, science and religion of an outstanding age; their transactions and pronouncements aroused intense interest. Probably the best known of those men today is Newton, and in some ways he serves now as the best example of the complex character of that time, for he was entirely a man of the seventeenth century - not, as we tend to think, a twentieth century man born ahead of his time. That his mathematical-physical work was not to him the be-all and end-all of his ambition we know, being familiar with his famous remark:

I do not know what I may appear to the world, but to myself I seem to have been only

a boy playing on the sea-shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me. 1

But we usually assume that he was expressing regret that he had not discovered more mathematical laws. We do not always realize that his concept of the very nature of the undiscovered deeps of that "great ocean of truth" was fundamentally different from ours. Physics was only a part of his interest. He was a mystic, perhaps a heretic,² and an alchemist. His library was "well stocked with the standard alchemical and mystical books, such as Agrippa De Occulta Philosophia, Birrius De Transmutatione Metallorum, Fame and Confession of the Rosie Cross, Geber The Philosopher's Stone....." ³ Newton "devoted probably as much time to alchemy and chemistry, which were on study in his time, as he did to the physical sciences".⁴ Alchemy in the

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1. Brewster's Memoirs of Newton, Vol. II, chap. 27, cited in The Oxford Dictionary of Quotations, p. 289.
 2. Professor E.N.de C.Andrade, F.R.S., in a letter states: "He (Newton) is supposed to have been unsound on the Trinity, in fact to have been tainted with the doctrine of Arianism.... Newton's private religious convictions are believed to have bordered on heresy....."
 3. Speech by Andrade at the Royal Society Newton Tercentenary Celebrations, 15-19 July, 1946.
 4. Ibid.

seventeenth century was not a simple search for a way to turn lead to gold, however. It was far more. Conducted in deepest secrecy, involving subtle and universal symbolism, based on belief in "the correspondence of the operations in the vessel to those of the greater world",¹ it was an effort to find the final elixir, the philosopher's stone itself,

A substance of enormous potency, a small quantity of which would transform a very much larger quantity of base metal into silver or gold, and which had unexampled powers of healing the human body and indeed of perfecting all things in their kind. 2

To say that Newton was an alchemist, therefore, is not to say that he was a fanatic seeking an impossible and faintly ridiculous talisman. It is, rather, to say that he was a man of a philosophy most difficult for us now to comprehend.

The lines of thought, the spirit and language of these toilers in the early chemical laboratories have passed, and it is hard without prolonged study to disentangle meanings, if any, veiled in allegory, tinged with prophecy, coloured with religious belief and clouded with charlatanism in many cases. There is a correspondence between Newton and Boyle about a mercury that grows hot with gold - not every mercury obtained by extraction will do this, says Boyle, so that he did not mean mercury as we know it.

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1. Taylor, The Alchemists, p. 66.
 2. Ibid.

What did he mean? Newton, no doubt, was deeply interested in chemical operations - what was he seeking? 1

To approach an understanding of the seventeenth century way of thought he typified, we must give due consideration to the summing-up of his attitude pronounced by Lord Keynes:

Newton was not the first of the age of reason. He was the last of the magicians, the last of the Babylonians and Sumerians, the last great mind which looked out on the visible and intellectual world with the same eyes as those who began to build our intellectual inheritance rather less than 10,000 years agothe last wonder-child to whom the Magi could do sincere and appropriate homage..... Copernicus and Faustus in one. 2

Newton was a far-away man in a far-away time, a Western conjurer with Eastern dreams, who summoned up the old Aladdin with a new lamp and diverted himself by changing the image of the earth while his own eyes remained fixed on the unchanging sea.

His greatness was appreciated in his lifetime. The "Philosophical Transactions" review of his great Philosophiae Naturalis Principia Mathematica, March, 1687, stated:

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1. Andrade, ibid.
 2. Speech written for the Newton Tercentenary.

This incomparable Author having been at length prevailed upon to appear in public, has in this Treatise given a most notable instance of the extent of the powers of the Mind.....and it may be justly said, that so many and so Valuable Philosophical Truths, as are herein discovered and put past Dispute, were never yet owing to the Capacity and Industry of any one Man.

He was President of the Royal Society from 1703 until his death in 1727, and was for decades one of England's most eminent and respected citizens. Indeed, he was almost a public monument, and venerated as such as he drove about London in his carriage, an imposing figure, red of face, white of hair, enhaloed in his glory. Pope was but echoing popular sentiment when he wrote the epitaph, "Nature and Nature's laws lay hid in night:/ God said, Let Newton be! and all was light".

Almost as honoured as Newton in his time was Christopher Wren. This many-sided genius, called by the historian, H.A.L.Fisher, "Probably the greatest Englishman since Shakespeare",¹ was a distinguished mathematician - Newton spoke highly of his work as a geometrician - astronomer and anatomist before he turned his full talent to architec-

1. Cited by Dorothy Stimpson, Scientists and Amateurs, p. 72.

ture at the time of the Great Fire. He was particularly effective as a pioneer in the study and practice of blood transfusion. In 1656, at the age of twenty-four, he suggested and "first successfully demonstrated.....the infusion of a liquid directly into a dog's veins".¹

By this Operation divers Creatures were immediately purg'd, vomited, intoxicated, kill'd, or reviv'd, according to the quality of the Liquor injected: Hence arose many new Experiments, and chiefly that of Transfusing Blood, which the Society has prosecuted in sundry instances, that will probably end in extraordinary Success,

Sprat reported enthusiastically.² In 1659 Wren transfused blood directly from one animal to another, by means of a quill. Experimentation continued with great success and excitement, and wildest expectation. Boyle expressed the general hope when he wrote:

.....'tis intended, that these tryals shall be prosecuted to the utmost variety the subject will bear: As by exchanging the bloud of Old and Young, Sick and Healthy, Hot and Cold, Fierce and Fearful, Tame and Wild Animals, &c and that not only of the same but of differing kinds.....the most probable use of this

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1. Stimpson, ibid., p. 84.
 2. Sprat, op. cit., p. 317

Experiment may be conjectured to be that one
Animal may live with the blood of another. 1

Transfusions were tried between different species, notably from sheep to spaniel, and on November 23, 1667, Dr. Richard Lower and Edmond King performed for the Society the first human transfusion in England - they "introduced with no apparent ill effect nine or ten ounces of blood from the artery of a sheep into a man variously described as a 'harmless lunatic' and 'an eccentric scholar.'" 2 So much international attention and imitation was inspired by transfusion trials that as early as December 4, 1665, "Philosophical Transactions" saw fit to print this "Account of the Rise and Attempts, of a Way to convey Liquors immediately into the Mass of Blood:

Whereas there have lately appeared in publick some Books, printed beyond the Seas, treating of the Way of Injecting Liquors into Veins; in which Books the Original of that Invention seems to be adscribed to others, besides him, to whom it really belongs; It will surely not be thought amiss, if something be said, whereby the true Inventor's right may beyond exception be asserted and preserved; to which end, there will need no

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1. "Philosophical Transactions", December 17, 1666.
 2. Stimpson, op. cit., p. 86.

more, than barely to represent the Time when, and the place where, and among whom it was first started and put to trial..... At least six years since.....the Learned and Ingenious Dr. Christopher Wren did propose in the University of Oxford (where he now is the Worthy Savilian Professor of Astronomy.....).....that he thought, he could easily contrive a Way to convey any liquid thing immediately into the Mass of Blood.....since which time, it hath been frequently practised both in Oxford and London; as well before the Royal Society, as elsewhere.

The Worthy Savilian Professor of Astronomy, while thus injecting new life into medicine, rebuilding London,¹ and illuminating various other fields of art and science, also found time, as a proper man of the age, to interest himself in several fabulous notions. On June 27, 1667, Birch records,² "Dr. Wren.....observed, that all insects breed mites, when they are dead", on June 3, 1680, "Sir Christopher Wren and Mr. Aubrey mentioned a production which they had seen, from a male cat and a female rabbit," and on June 29, 1681,

.....the president (Wren).....related likewise, that the people near Hudson's Bay live to a great age, as 130 or 140 years, without the

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1. His epitaph, Si monumentum requiris, circumspice, is in St. Paul's Cathedral. It was written by his son.
 2. Thomas Birch, The History of the Royal Society.

use of spectacles..... The oldest, while they are able, run a hunting; and when they can do that no longer, desire to die, and give themselves up to their eldest sons to be strangled. 1

Wren was very partial to the "sympathetic powder" of the colourful Sir Kenelm Digby, a kind of telepathic healing agent which will be discussed more fully later, and, according to Birch, on December 23, 1663, at a meeting of the Society,

Occasion being given to discourse of tormenting a person with the sympathy-powder, Dr. Wren related, that in the house of a kinsman of his, the experiment had been tried by him upon a servant, who had grievously cut her finger; and a rag rubbed upon the wound being dressed with calcined vitriol, and put into the maid's bosom, her finger within a short time was cured. Whereupon he had taken the rag from her, and heated it upon the fire, whilst the maid was sweeping the next chamber; who, upon a sudden, flung away the broom, and cried out for the pain in her finger; which being looked to, was found very fiery: upon which they cooled the rag again, and dressed it as formerly, and within a day or two the finger was intirely cured. Mr. Boyle undertook to try this experiment upon a dog.

Wren the anatomist-astronomer-architect was also "the wonder of Europe for mechanical invention".² But

1. Birch, ibid.

2. Bryant, King Charles II, p. 98.

in this respect he was outdone by his Society fellow, the irascible Robert Hooke.

Hooke was almost a universal genius, with his hands as well as his head. He was "one of the most ingenious philosophers whom the world has ever seen.....perhaps no man ever made so many discoveries." ¹ Hooke's work in optics and gravity rivalled that of Newton. Indeed, he quarrelled so fiercely with Newton about priority of discovery of laws that the author of the Principia all but retired from the fray. Hooke made notable discoveries in the fields of atmospheric phenomena, capillary attraction and the nature of fluids. He invented, or claimed to have invented, for he was forever locked in mortal combat with others about priorities, the universal joint, the balance-spring for watches, the barometer, the double-barrelled air-pump, a kind of steam-engine and a kind of telegraph instrument, a device for cutting clock and watch wheels, and various other contrivances ranging from a conical pendulum to an instrument for supplying air to a diving bell. He even coined a word: "cell". His

1. Allibone, A Critical Dictionary of English Literature and British and American Authors, Vol. I, p. 877.

work with telescope and microscope was outstanding, and his formula, "ut tensio, sic vis," (power, of a spring, varies with tension), is still listed as "Hooke's Law" in school textbooks of physics. His status in the Royal Society was somewhat ambivalent, as he was both a Fellow and an employee. For varying stipends ¹ he acted as curator and experimenter-general, and surely no curator and experimenter-general in history has so amply earned his salary. The da Vinci-like range of Hooke's interests and abilities is only partially demonstrated by perusal of the Society records; he published many books of his own, aided others in their work, and kept vast notebooks full of ideas proposed, tested and, often, proved. He speculated on spontaneous generation (which he rather doubted); devices for improving hearing, smelling, tasting and touching as spectacles had improved seeing; air-girdles to keep men afloat

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1. The Society was not rich, and on one occasion it was proposed that Hooke be paid in copies of Willughby's Historia Piscium, a Society-printed book of which many copies remained unsold. Hooke refused. The cost of printing the Historia had so impoverished the Society that there was not enough money left for the printing of Newton's Principia; Halley undertook to print this at his own expense.

and wheels in which they might walk over water as well as vessels in which they could travel under water; a flying machine; a method of giving one man the strength of twenty men or more. He advanced the opinion that Raphael did not understand perspective, and he measured speed of sound by observing time taken for the boom of the Tower cannon to reach Gresham College.¹ He cited Plato to bolster a theory he had about occurrence of floods and fires, and supposed that the veins in marble were caused by earthquakes breaking the stones and allowing a petrifying juice to fill the clefts. The breadth and profundity of Hooke's theorizing seems incredible to us now until we remind ourselves of the astonishing mental scope and agility of the time.² Hooke was

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1. Hooke's estimate, 143 yards per second, was probably faulty because of faulty watches and distance surveys of the time. Speed of sound is actually about 370 yards per second.
 2. In a little book called A Century of the Names and Scantlings of Such Inventions, As at Present I can call to mind, the author, the Earl of Worcester, lists among his "inventions" a method of levelling cannons by night, a "ship-destroying engine", an unsinkable ship, a "sea-sailing fort", a portable bridge, a "to and fro lever", a "pinck'd glove alphabet", a needle alphabet, a key pistol, a "most conceited tinder-box", a pocket ladder, an "artificial bird", a "pleasant floting garden", an "untoothsome pear", an "imprisoning chair", a "stupendious water work", a "semi-omnipotent engine", and "a flying man.....which I have tried with a little Boy.....in a Barn, from one end to the other, on an Hay-mow".

one of the least gullible, least troubled by tradition of the major philosophers of his time, and despite an occasional enthusiasm for an improbable device such as his flying machine, which would have utilized leg-power of the operator, this son of an Isle of Wight rector was rarely at fault in his judgment. On large issues he was usually a cool as well as a brilliant thinker.

If the breadth and depth of vision of these men of the early Royal Society are best demonstrated by Hooke, Wren and Newton, then the intensity of their concern over religion, a concern that coloured all their thought and wherever possible added to the general appeal of their work, can best be exemplified by Boyle.

Robert Boyle, seventh son of the "Great Earl of Cork" and the only one of the Earl's fifteen children to refuse a title, at the age of ten "imposed disciplinary tasks in arithmetic and algebra upon himself for reading the romance Amadis de Gaula",¹ at the age of fourteen became "duly impressed with the supreme importance of religious

1. Mitchell, Robert Boyle, Devout Naturalist, p. 136.

truth",¹ and thereafter remained more absorbed in religious contemplation than in physical and chemical exploration. Boyle, who has been called "the founder of the new chemistry, the man who converted alchemy into a science",² was so devout that Sir Peter Pett, who knew him for nearly forty years, said that he "never mentioned the name of God without making a decided pause in the conversation".³ Lord Clarendon urged Boyle to enter holy orders, but he refused, saying "no man taketh this honour unto himself",⁴ and continued to go his saint-like and brilliant way, blending in happiest combination "the solid learning and great acuteness of the philosopher.....with all that veneration for God, and love to His revealed will, which so eminently characterized him as a Christian",⁵ and made him one of the best loved of all great thinkers.

Boyle's extreme piety was not an isolated phenomenon among the Society members of a time which still imagined no separation between God and world,

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1. Allibone, op. cit., Vol. I, p. 232.
 2. Fisher, op. cit., p. 18. Boyle is now chiefly remembered for "Boyle's Law": volume of a gas varies inversely as pressure.
 3. Allibone, op. cit., Vol. I, p. 232.
 4. Ibid.
 5. Ibid., p. 233.

soul and science, which still found tongues in trees, books in the running brooks, sermons in stones - if not good in everything. He was one among many devout scientists; which was a reason for the great influence of the Society in that age so concerned over the wounding of faith by science.

Add to such world-renowned men as Newton, Wren, Hooke and Boyle the Poet-Laureate, Dryden,¹ the highly-respected civil servant Pepys and his co-diarist Evelyn, "one of the most estimable characters of literary history",² Seth Ward, "in mathematics and philosophy, and in the strength of judgment and understanding, one of the first men of his time",³ and the great John Locke, "one of the most illustrious of philosophers and excellent of men",⁴ and some estimate can be made of the character and calibre of the Royal Society of that period. And there were scores of other members hardly less distinguished. Edmund Halley, the world-traveller,

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1. The Society's Journal Book records, Nov. 12, 1662: "Mr. Dridon proposed Candidate by Dr. Charleton." He was elected a week later. He became Laureate in 1670.
 2. Allibone, op. cit., Vol. I, p. 566.
 3. Ibid., Vol. III, p. 2577, cited from Bishop Burnet. Ward became Bishop of Exeter and of Salisbury.
 4. Ibid., Vol. I, p. 1112.

was a close friend of Newton's, an expert astronomer-mathematician in his own right - he is now chiefly remembered as the charter of "Halley's Comet" ¹ - and a renowned classical scholar. The modest John Ray, "with Linnaeus, the chief founder of the science of systematic biology", ² was famed throughout Europe for his natural history observations. ³ As eminent as Ray and Halley in their special fields were Leeuwenhoeck, first man to record the sight of bacteria; Huygens, discoverer of polarization of

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1. Seen in 1066, during the invasion, again in 1682, again in 1910. Next appearance is scheduled for 1985.
 2. Singer, The Story of Living Things, p. 181.
 3. An event in Ray's life illustrates a conflict which must often have troubled the seventeenth century thinkers, the conflict of reasoned conclusion with faith. Ray's daughter fell ill of jaundice. He put her in the hands of the most "scientific" doctors available, and she died. On February 1, 1698, he wrote to his friend Hans Sloane, then Royal Society secretary: "My dear child.....died apoplectic, which was to myself and wife a most sore blow Nothing afflicts me so much (as) that I did not in time make use of that remedy which I had proved so effectual to my own relief and cure in the same disease..... I am not in case to write much....." "That remedy", passed on to Ray by his mother, an herbalist, was "an infusion of stone-horse dung steeped in ale for a night with a little saffron added and in the morning strained and.....sweetened with a little sugar.....about half a pint at a time." Raven, John Ray, pp. 295 f.

light; Malpighius, whose observation of capillaries completed the evidence needed to prove Harvey's theory of blood circulation, and Nehemiah Grew, who put forward the theory that flowers are the sex organs of plants. And there were still others, in other fields, whose names may not be so familiar to-day but who were in the seventeenth century quite as famous as these. Sir Robert Moray, for instance, a mainstay of the Society in its earliest years, commanded great respect as a soldier and statesman - a respect not lessened by the fact that he was a close friend of the King's.

Prestige of a different sort was conferred upon the Society by the membership of great lords. King Charles declared himself Patron and Founder; his cousin Prince Rupert, the "Mad Cavalier" of the royalist armies in the 1640's, was also a patron and Fellow, and for a time the Society was regarded as fashionable by the titled gentlemen who styled themselves "virtuosi", or amateur experimenters.¹ Cosimo III, Grand Duke of Tuscany; Count Ubaldini

1. Birch records that on December 12, 1660, it was voted that "no person should be admitted into the society, without scrutiny, except such as were of, or above, the degree of baron."

of Monte Feltre; the Duke of Buckingham; the Earl of Sandwich; Lord Brouncker, and others lent the lustre of their names to the proceedings. As a matter of fact, the King himself took a keen if somewhat sceptical interest in the Society's transactions. On March 4, 1661, he sent to the virtuosi "five little glass bubbles" for investigation.¹ In May of that same year Charles sat up all night with "a party of mathematicians from the Philosophical Society"² to watch an eclipse of Saturn, and the following July he "desired to have a reason assigned, why the sensitive plants stir and contract themselves upon being touched".³ And there is a story, which Miss Stimpson believes may be apocryphal, that on the night of the Society's founding the King came and confounded his fellow Fellows with the query: why does a pail of water not weigh more when a fish

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1. Birch. The bubbles were probably "Prince Rupert's drops", made by pouring molten glass into water.
 2. Bryant, op. cit., p. 142. The Royal Society was not chartered until July 15, 1662. Before that time the virtuosi were called "Oxonian Sparkles" and "the Philosophical Society of Oxford" and "The Greshamites" and "The Wadhamites" and "The Invisible College" and by various other names.
 3. Birch.

is put into it? ¹ He sent them two magnets for investigation. He seems to have kept an eye on the Society's proceedings, but to have derived more amusement than instruction therefrom. Pepys, for instance, notes in his diary, February 1, 1664, that Charles "mightily laughed at Gresham College for spending time only in weighing of ayre and doing nothing else since they sat". On January 12, 1671, "Sir Robert Moray mentioned, that the King had laid a wager of fifty pounds to five for the compression of air by water; and that it was acknowledged, that His Majesty had won the wager." ² That the Society under Charles II enjoyed a rather indulgent royal favour is evidenced by an entry of July 22, 1663, in Birch: "Sir Robert Moray mentioned, that the King had made an experiment of keeping a sturgeon in fresh water in St. James's Park for a whole year; it was moved to kill it, and see how it would eat." And on March 2, 1671, "Dr. Clarke proposed, that a

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1. The answer is, of course, that it does. This problem of the supposedly weightless fish once occupied the attention of the Roman Senate for an entire day - until one Senator stopped the debate by weighing a pail of water with and without a fish and proved the assumption of "weightlessness" false.
 2. Birch - who gives no further details concerning this wager.

man hanged might be begged of the King, to try to revive him, and that in case he were revived, he might have his life granted him." ¹

The King was not alone in maintaining a somewhat less than reverent attitude toward the Society. Along with the admiration aroused by the more solid achievements of the Fellows, there was a measurable amount of amusement inspired by their lesser enterprises. For naturally these men, as curious as children with their new toys of telescope, microscope, barometer, thermometer, air pump and pendulum, did not confine their attentions to obvious problems of ponderous moment. Nothing was too odd or unimportant for investigation.² They speculated on the effect of thunder on silk worms, the cause of colours, the new American whale-fishing about the

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1. Birch. No instance of revivification of a hanged man is noted. But Charles once ordered a condemned man to be weighed before and after execution, and those in charge of the experiment reported loss of weight after death.
 2. And nothing was allowed to halt their investigation. "Even in death's dark vale," writes Bryant, op. cit., p. 98, "when the plague was at its height, Evelyn, calling at Durdans (in Surrey), discovered Dr. Wilkins, Sir William Petty and Mr. Hooke contriving chariots, new rigging for ships, a wheel to run races in, and other mechanical inventions."

Bermudas, the specific gravity of pump-water, and the liver of the Earl of Balcarres.¹ They designed pneumatic engines, aeolopiles for weighing air, calculating machines,² "a new fashion gun to shoot off often, one after another, without trouble or danger, very pretty",³ and a double-bottomed boat. They inquired if winds cause diseases, if the Ark came from the lost Atlantis, if bastards are more sprightly than legitimate children, if the human body contains eight pounds of blood,⁴ if Chinese was the universal primitive language, if Japan was an island, and if "feathers from the breech of an Old Cock" will cure hydrophobia.⁵ They wondered whether serene air is heaviest, whether stones will grow in water,⁶ whether there is a poison "so quick,

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1. They dissected the Earl.
 2. Leibnitz actually made a calculating machine. So did Pascal.
 3. Cited by Bryant, *op. cit.*, p. 98.
 4. Allen Moulin thought it did. ("Phil. Trans.", December, 1687.) Actually the average body contains about nine pints of blood.
 5. "A Never failing Remedy.....by Sr. Theodore Mayern", "Phil. Trans.", December, 1687.
 6. On June 3, 1663 (Birch), "Sir Robert Moray and Mr. Henshaw were appointed curators of the experiment of inclosing a pebble in a glass with water, to see whether in time it will grow too big to come out of the hole....." and on April 21, 1673 ("Phil. Trans.") it was inquired "how stones grow, whether by a kind of vegetation?"

as to turn a man's blood suddenly into jelly",¹ and whether a dead man's hand will remove warts.² They asked Lord Henry Howard in Barbary "whether it be true.....that the fortune-tellers at Fez, by pouring some drops of oil into a glass of water, can represent creatures, and shew them to bystanders, and speaking to them, do receive answers by words or signs?"³ They considered a method whereby England might "outdo the Dutch without Fighting".⁴

On January 28, 1685 ("Phil. Trans."), Sir William Petty produced "a Miscellaneous Catalogue of Mean, vulgar, cheap and simple Experiments", including these:

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1. Birch: May 22, 1661. On March 28, 1672 (Birch), Lord Henry Howard was asked if there was a poison in Barbary that "kills by smell alone". He replied, "They have several poisons that kill, but not by the smelling of them."
 2. A letter from the "learned Dr. John Beale", May 7, 1686, "Phil. Trans.", states: ".....a certain Cook in a Noble Family.....having been reproached for the ugliness of his Warty handswas bid by his Lord, to rub his hand with that of a dead man; and that his Lord dying soon after, the Cook made use both of his Lords advise and hand, and speedily found good effect."
 3. Birch: October 26, 1672. Lord Henry replied, "They use no fortune-telling, but by a kind of necromancy they pretend to procure love or hatred."
 4. "Phil. Trans.", January 29, 1677, review of a book by "Andrew Yarranton Gent." The book went on to promise a method to "pay debts without Mony: to set at work all the Poor in England.....to Prevent unnecessary Suits in Lawto prevent Fires in London" and provide "cheap Bread and cheap Drink....." The Yarranton method seems not to have been adopted.

What space several sorts of Animals will run in a minute viz. a Horse, Greyhound, Hare, Fox, Rabbit, even to a Louse, and other creeping animals?

What proportion of each sort of Letters are in the English, Latin and French Tongues, &c ?

Forasmuch as all Printers Letters are of the same height, quære the Weight of an Alphabet of the several usual sizes?

The quantity of Stuff in any Garment propounded, and the length of the several Seams and the Sewing Thread, and number of Stitches in the same?

The quantities of Rain that fall in an hour upon the same scope of Land?

What difference in the way of Ships per hour in all varieties of cases?

The proportion between the length, weight and thickness of the best Bows and Arrows?

On October 2, 1661, (Birch), Dr. Ent was required "to give in writing some considerations, why it is hotter in summer than in winter," and on September 24, 1662 (Birch), "Dr. Ent observed, that it was found by experience, that no oaks grow well but from acorns". The reviewer of a treatise on physics by Jaques Rohault of Paris stated that "he renders an Accompt of Gravity.....and maketh Gravity nothing else but a less Levity". ("Phil. Trans.") The Fellows considered the possibility that myrtle berries were once used for pepper; that "if it

were not for the perpetual Circulation of the Juyces in the Body, constantly transpiring through the pores thereof, we should either become petrified, or be incircled with a Bark",¹ and that there might be a Northeast Passage.² They debated proposals of the versatile John Wilkins, Lord Bishop of Chester and brother-in-law of Oliver Cromwell, designed to establish a universal language, a "secret messenger" for long distance communication, and "four several ways to get to the moon".³ They spent much time

1. Review of book by "William Sympson, M.D.", "Phil. Trans.", August 8, 1670.
2. General interest in travel was keen then. The preface to The Travels of Monsieur de Thevenot into the Levant, (1687), states: "It would be needless.....by any Preliminary Discourse, to recommend the relations of Travels to Publick Perusal; since the Universal Approbation they meet with in the World, and the eagerness wherewith they are sought after by all People, is an Argument convincing enough, that they are Delightful at least, if not also Profitable."
3. Wilkins' universal language anticipated Esperanto and his "secret messenger" foreshadowed the telephone. His "four several ways" to reach the moon were: "By spirits, or angels By the help of Fowls..... By wings fastened immediately to the body..... By a flying chariot." Cited from Raven, The English Naturalists from Neckham to Ray, p. 341 and Marjorie Nicholson, Voyages to the Moon, p. 40.

arguing the merits of the "sympathetic powder".¹ This was composed of varying ingredients and charged with varying powers. Sir Kenelm Digby himself seems to have tried copper sulphate, and "calcined powder of toades reverberated," which, "being applied in baggs uppon the stomach of a pestiferate body, cures it by severall applications,"² while "Georgius Hieronymus Velschius" tried "Vitriol both burnt and unburnt".³ Sir Kenelm also advocated a

1. According to Gunther, op. cit., Vol. I, p. 38, "This remarkable man had been so upset by the death of his wife (the celebrated beauty Venetia Stanley) in 1633 that he retired to Gresham College, and there 'diverted himself with chymistry.....' He 'wore a long mourning cloake, a high crowned hat, his beard unshorne.....as signs of sorrow for his beloved wife, who, as gossip reported, was shown to have had but little brain at a post-mortem examination, which was attributed to the fact that she had drunk viper-wine, for her complexion - by her husband's advice.'" (Pliny had commended viper broth for general health, and Boyle said dried viper flesh was a useful cordial.) Sir Kenelm was a Roman Catholic, a collector of book-bindings, an ex-Admiral and a strikingly handsome man, and his signature is much the largest on the first page of the Royal Society's Journal Book, December 5, 1660.
2. Birch; June 5, 1661. Mme de Sévigné thought Sir Kenelm's powder was "a perfectly divine remedy". Haggard, Devils, Drugs, and Doctors, p. 328.
3. "Phil. Trans.", July 18, 1676. Velschius reported that a wound he had treated with the powder had healed, but "the same might have been as well cured without it, by the meer winding of linnen about it, and keeping the Air from it....."

"sympathetic medicine" for healing wounds, involving anointment not of the wound but of the weapon that had caused it. Efficacy of this treatment depended upon

.....atomical aporrhea, which passing from the Cruentate cloth or weapon to the wound, and being incorporated with the particles of the salve carry them in their embraces to the affected part: where the medicinal atomes entering altogether with the effluvioms of the bloud, do by their subtle insinuation better effect the cure, then can be done by any grosser applications. 1

The various sympathetic powders and medicines became most effective subjects for satire by those who were unsympathetic to the Royal Society. In Hudibras Butler speaks of weapons which "dress'd with salves, restore / And heal the hurts they gave before," and "supplemental noses, which / Would last as long as parent breech, / But when the date of Nock was out, / Off dropt the Sympathetic Snout," and wounds which "by wider wounds are heal'd, / And poisons by themselves expell'd".² Indeed, the Society's lesser enterprises provoked the mirth and

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1. Glenvill, The Vanity of Dogmatizing, pp. 207 f.
 2. Hudibras, passim. The "sympathetic snout" was occasioned by Digby's interest in a method for grafting noses.

malice of several generations of satirists - some of them the best in the business. Butler said Hudibras "could divide a hair 'twixt south, and south-west side," and "prove a buzzard is no fowl," while Ralpho "understood the speech of birds,"¹ and in his Elephant in the Moon and his fragment On the Royal Society this author's satire was even more savage.² Thomas Shadwell in 1673 produced his play, The Virtuoso, with a leading character, Sir Nicholas Gimcrack, who is described by other players as

.....an enemy to Wit, as all Virtuoso's are
 A Sot, that has spent 2000 l. in Microscopes, to find out the Nature of Eels in Vinegar, Mites in a Cheese.....broken his brains about the nature of Maggots.....studi'd these twenty years to find out the several sorts of Spiders, and never cares for understanding Mankind. ³

In 1687 Mrs. Aphra Behn's farce, The Emperor in the Moon, began a long London run. In this play two

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1. Ibid., passim.
 2. Butler's "elephant in the moon" turned out to be a mouse in the telescope.
 3. The Works of Tho. Shadwell, esq., pp. 6 f. of "The Virtuoso". Sir Nicholas also swims on land, transfuses spaniel's blood into a mad-man, makes weeds "speak eloquently" and observes "publick buildings" on the moon.

lovers disguise themselves as men from the moon to gain access to two daughters of a virtuoso-doctor. Typical of the mockery directed against the Society in those early years is this fragment from William King's Dialogues of the Dead:

Signor Indifferento: Where have you been, Moderno, in the name of wonder! You make such a hideous figure and are so dirty that no gentleman would come near you! What, has your horse thrown you? Or what is the matter?

Signor Moderno: The Matter! Why, I have been in a ditch.

Indifferento: By some accident, I suppose.

Moderno: Accident! No, you know better sure than that. Gentlemen of my estate, fortune, education, parts and learning, do not use to go into a ditch by accident, but choice. There has been more true experience in Natural Philosophy gathered out of ditches in this latter century, than Pliny and Aristotle were masters of both together..... 1

And there were other critics of the Society even more blunt than the literary satirists. One of the most determined and effective was the notable classicist and mathematician Henry Stubbe, a Warwick physician who waged direct war with the Society for years. He called the Fellows "Airy

1. Cited from Notes and Records of the Royal Society, Vol. 7, no. 2, April, 1950.

wits and Drolls..... Our Modern Insolents.....
 These Comical Wits..... Pitiful Mechaniciens (with)
deceitful Telescopes", and warned that there
 was a

.....greater necessitie of securing our Eares
 with black wooll or Wax, against the Buz and
 Noise of the Prattle-boxes, then ever Ulysses
 had upon approach to the Sirens: Our ruine
 being as certain from them..... 1

Thomas Hobbes engaged in fiery controversy with the Society, "in defence", as Chambers' Bio-graphical Dictionary puts it, "of his own hopelessly indefensible mathematical ideas". Hobbes wrote a book professing to demonstrate a method for squaring the circle.² John Wallis and Seth Ward, Fellows of the Society, refuted his claim. Hobbes wrote:

So go your ways you uncivil ecclesiastics, unhuman divines, dedactors of morality, unasinous colleagues, egregious pair of Issachars, most wretched Vindices and Indices Aca-demarium; and remember Vespasian's Law. 3

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1. Stubbe, Legends no Histories, passim. Boyle remained friendly with Stubbe because he believed him to be "sincere and thought his criticisms useful". (More, The Life and Works of the Honourable Robert Boyle, p. 112.)
 2. Not until 1768 was it proved that the circle cannot be squared by algebraic methods.
 3. Cited by More, op. cit., p. 98. Vespasian's Law: "It is unlawful to give ill language first, but civil and lawful to return it."

The Fellows went their ways, unsquared, and Hobbes went his, in opposition, and muted echoes of the spirited skirmishes may still be heard in the Society's proceedings. On December 30, 1661 (Birch) Wallis wrote to Oldenburg, who was then acting secretary for the group about to become the Royal Society, "I am now employed upon another work, as hard almost as to make Mr. Hobbes understand mathematics. It is to teach a person deaf and dumb to speak, and to understand a language, &c." In "Phil. Trans." of January 17, 1670, appeared "An Accompt of a small Tract, entituled, Thomas Hobbes Quadratura Circuli, Cubatio Sphaera, Duplication Cubi.....Denuo Refutata, Auth. Joh. Wallis, S.T.D....." And on March 25, 1678, the "Phil. Trans." reviewer of Hobbes' Ten Dialogues of Natural Philosophy wrote, "I am not more certain of the Authors being a learned Man, than I am of his mistakes in several Particulars of this Book". There is no evidence in the Society's transactions that the originator of Leviathan ever made peace with the virtuosi.

The Church and the Universities also withheld approval from the Society in the seventeenth century. The Church was not so scientifically minded as might be inferred from the presence in the

Society of such noted divines as Ward and Wallis and Wilkins; Archbishop Ussher had just (1650-54) published Annales Veteris et Novi Testamenti, establishing the date of Creation as October 4, 4004 B.C., 9 a.m. winter time, and most of the clergy were traditionally inclined, and wary of the "new Philosophy". Dr. John Fell, Dean of Christ Church, Oxford, and hero of the "I do not like thee, Dr. Fell," rhyme, in a sermon preached before the King in 1675, said:

Indeed for a fool to say in his heart there is no God, is not without examples but for a Sect of men to say it with their mouth, dictate it as Philosophy and for that be esteem'd Wits and Masters of Reason is utterly without the precedents of ancient times and an atchievement to compare with the last dotage of the world. 1

The University attitude to the Society was quite as hostile as was that of the Church. "The Universities were strongholds of tradition and privilege," writes Raven, and "in Milton's time, 1625-32, attention (at Cambridge) was still directed almost exclusively to the studies of the traditional

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1. Cited from Notes and Records, Vol. 8, No. 1, October, 1950.

trivium, 'Grammar, Logic and Rhetoric.'" ¹ On July 9, 1669, Dr. South, the Oxford University orator, giving the "long" and "eloquent" official oration at the dedication of the Sheldonian theatre (designed by Wren), accused the virtuosi of admiring "nothing except fleas, lice and themselves", indulged in "execrations" and "satirical invectives against Cromwell, fanatics, the Royal Society and new philosophy", and ended by "damning them ad inferos, ad gehennam". ² Most of the University dons were still hard at work on alchemy and metaphysics and the solving of such problems as "can love be induced by philtres?" and "did Duns Scotus write better Latin than Cicero?" ³ On August 8, 1670, there is a "Phil. Trans." review of a book with the unusually short title of De Anglorum Gentis Origine Disceptatio by "Robert Sheringham, Cambridge univ.," which states:

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1. Raven, John Ray, pp. 25, 23.
 2. Cited from D'Israeli and Wallis, by Stimpson, op. cit., p. 77. Even the gentle Evelyn was moved to remark that South's furious speech was "not without some malicious and indecent reflections on the Royal Society, as underminers of the University, which was very foolish and untrue, as well as unseasonable". (Evelyn, Diary, July 9, 1669.)
 3. Ashley, England in the Seventeenth Century, p. 157.

In his Inquiry he finds nothing that may be more certain in so great obscurity, than that the old Britains were descended from the Trojans, by Brutus, the Offspring of Aeneas; and that the Angli are the Race of the Gothick Nation (which he maketh the Offspring not of Japhet, but of Sem:) Further, that the Getae or Goths did pass through Scythia into Scandia and Sarmatia, and from Scandia into the Iles of the Baltick Sea and Germany.....

On January 20, 1673, "Phil. Trans." lists three "local Origins of Wind" as deduced by "R. Bohun Fellow of N. College in Oxon.":

In the Lower Region, by the Dilatation of Vapours of the Air..... From the Earth or Seas, as from Sub.marine or Sub-terraneal Eruptions..... By descension from the Middle Region; where he makes their Gravity to be the Cause of their Descent.....

The medical men also viewed the Society's endeavours with a jaundiced eye. All the doctors were not so advanced as Harvey. Thomas Sherley, "Physitian in Ordinary to his Majestie, London". on March 25, 1672, ("Phil. Trans."), was busy with "that ancient Hypothesis, which imports, that Stones and all other Sublunary Bodies are made of Water condensed by the powers of Seeds, which by the vertue of their fermentive Odours, perform these transmutations into Matter". "Dr. John Betts M.D." on February 15, 1669, ("Phil. Trans."), "endeavours to

shew that milk" or "something analogous to it" is the "whole Matter of Blood". Dr. "Gualtero Needham" contested "the pretended kindling of a vital Flame" by finding "the Bloud unfit for taking Fire", since "Examples are very rare of Liquors kindled by ventilation", and "the Animal Spirits are not found in the form of flame" anyway. ("Phil. Trans.", "Munday, Septem. 1667".) On August 20, 1684 ("Phil. Trans."), "Joh. Dolaei M.D." described the "Anima Brutorum" as a

.....Microcosmeter, which presides over the whole body; the other subordinate faculties, have their distinct names given them.....as Vice-royes residing in the principle viscera as in Provinces: Cardimelech in the heart; Gasteranax in the stomach, and so of the rest.

"Thomas Willis M.D., F.R.S." on May 20, 1672 ("Phil. Trans."), "distinguishes this meerly vital and Sensitive Soul (of animals) from the Rational, to which he makes it subordinate, and so maketh man a Double-soul'd Animal." And over in Paris the King's "chief Operator in his Royal Garden of Plants," Moses Charas, was publishing The Royal Pharmacopaea, Galeno-Chymical in which

The diligent and Ingenious Author.....
treateth of Chymical Preparations.....of Tinctures, Elixirs.....of Humane Skull.....of

Vipers, Hartshorn, Toads, Frogs, River-Crabs,
 Storks, Honey, Wax, and Earth-worms, Cantha-
 rides, Ants, the Peacock and Castor.....Amber-
 greese, Amber.....the Infernal Stone.....Bezo-
 ardicum Joviale.....the Icy Liquor.....Philo-
 sophic Spirit..... 1

It is small wonder that the doctors of the time, possessed of such a low degree of scientific sophistication, along with the usual distrust of novelty, often reddened their literary lancets with the blood of the virtuosi. Indeed, it now appears that a highly-placed member of the medical profession was the unpublicized sponsor of the vendetta of Stubbe against the Society. According to Harcourt Brown, Stubbe was secretly employed by Dr. Hamey, a Fellow and benefactor of the Royal College of Physicians, "out of jealousy and fear of the Royal Society.....to criticize the Society as vigorously and as violently at every point as he could".²

Even the ballad-makers found subject matter in the Society's activities. Some doggerel verses of 1663 or earlier describe various presumed occupations of the "Seaventie wise men in one

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1. "Phil. Trans.", March 25, 1678. This is the same Charas who engaged in such heated controversy with Redi about the nature of viper poison.
 2. Brown, Scientific Organizations in Seventeenth Century France, as cited by Stimpson, op. cit., p. 87.

Schoole," remarking that ".....the like before / Were never donne, nor wilbe agen," and concluding ".....in Ballad Fashion / God blesse the King and this nee Corporation", and when Margaret Cavendish, Duchess of Newcastle, called "Mad Madge" because of her eccentricities, visited the Society in 1667, Pepys wrote that she was "full of admiration, all admiration," but "we do believe the town will be full of ballads of it". 1

In the midst of all these various scofferies and attacks, King Charles was far from being a very present help in trouble for the Society which he had helped to found. Instead, he seems to have enjoyed the fireworks, and to have gone about with a copy of Hudibras in his pocket.² But the Society was not helpless. The slings and arrows of outrageous criticism inspired the Fellows to passionate and effective gestures of defence.

In 1667 Thomas Sprat, who later became Bishop of Rochester, published his History of the Royal Society, which was more than an attempt to

1. Pepys, Diary, Ns. 30-31, pp. 166 f. There are no extant ballads of the visit of "Mad Madge" to the Society.
2. More, op. cit., p. 111.

justify the ways of the Society to men. The History helped to change the course of English prose. "Sprat was one of the excellent writers who formed the lucid prose of the Reformation era," Trevelyan has stated.¹ Sprat lauded present achievements of the Society, declaring its purpose was to "increase the powers of all mankind and to free them from the bondage of errors" by exposing and destroying superstitions. He promised even better for the future - "and we may well guess that the absolute perfection of the True Philosophy is not far off". He attacked "poetic" language, "this vicious abundance of phrase, this trick of Metaphors, this volubility of Tongue," claiming that the Society Fellows

.....have therefore been most rigorous in putting into execution, the only Remedy that can be found for this extravagance: and that has been, a constant Resolution, to reject all the amplifications, digressions, and swellings of style: to return back to the primitive purity, and shortness, when men deliver'd so many things, almost in an equal number of words..... A close, naked, natural way of speaking; positive expressions, clear senses.....

Valiantly he strove to enlist support of the "wits and railleurs.....these terrible men". For, he

1. Trevelyan, Illustrated English Social History, Vol. II, p. 116.

wrote, "I acknowledge that we ought to have a great dread of their power. I confess I believe that New Philosophy need not (as Caesar) fear the pale of the melancholy as much as the humorous and merry." ¹ Sprat did not succeed in immediately reducing the Fellows' language to a "close, naked, natural way of speaking", nor did he disarm the "terrible men". But his book exerted great influence.

Joseph Glanvill, who provided Matthew Arnold with the model for the "Scholar Gypsy" and originated the phrase "climates of opinion", ² also laboured mightily in defence of the Society. Glanvill was somewhat like Sir Thomas Browne in his blending of "modern" scepticism with "ancient" faith. In fact, Willey says he might be called "Browne with a difference", the difference being mainly that "Glanvill's is a thinner medium". ³ He glorified the new philosophy, even declaring it no heresy to assert the still-debatable Copernican hypothesis of a planetary earth, but he was an ardent supporter

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1. Sprat, op. cit., passim.
 2. Both in Vanity of Dogmatizing, pp. 197, 227.
 3. Willey, The Seventeenth Century Background pp. 174, 176.

of "sympathetic" operations, believing it possible "to conferr at the distance of the Indies by Sympathetic conveyances",¹ he thought men could fly with wings, and he said "Looser Gentry, and the small Pretenders to Philosophy and Wit, are generally deriders of the belief in Witches and Apparitions", accusing them of a "mighty confidence grounded upon nothing, which swaggers and huffs and swears there are no witches".² Dugald Stewart said Glanvill demonstrated the "possible union of the highest intellectual gifts with the most degrading intellectual weakness".³ His works excited general interest, but, like Sprat's History, failed to

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1. Glanvill, op. cit., p. 182. Glanvill tells of a "Gentleman" whose hand was "sympathised" with that of a friend by mutual skin-grafts, so that pin-pricks could be felt "sympathetically" at a distance, who when the friend died requested his "Chirurgion" to cut off his arm, lest the "sympathised" hand rot away; a wise precaution, Glanvill notes, since "that which was so sensibly affected with so inconsiderable a touch, in all likelihood would be more immuted, by those greater alterations which are in Cadaverous Solutions". Ibid., pp. 205 f.
 2. Glanvill, Saducismus Triumphatus, Vol. 1, preface. "I am thus very industrious and zealous to support the belief in Spirits and Apparitions", Glanvill declared in the "account" preceding Saducismus - published fifteen years after Sprat in his History had congratulated mankind on the Royal Society's banishment of superstitions. (Who shall decide, when doctors disagree?)
 3. Cited by Allibone, op. cit., Vol. 1, p. 676.

accomplish the mission of silencing the critics who were attacking the Royal Society. Indeed, Glanvill's writings provided a principal target for the pen of the terrible Stubbe.

Other Fellows took up the literary cudgels in self-defence. Dryden's savage satire MacFlecknoe (1682) dealt Shadwell better than Sir Nicholas Gimcrack had given. And the Society itself in its publications lost no chance to return the fire of its foes. The Preface to the third year of "Phil. Trans.", March 11, 1667, after commending "our Ingenious Correspondents" for examining "all circumstances" with "care and diligence.....not taking up old Fame, or Flying Reports", went on to say:

Neither is it much amiss, that there are yet some, who do prefer the darkness of Old Heathenisme before the Noonlight. Otherwise, the next Age might hardly believe, that Men pretending to Wit, Prudence and Learning, would ever make such strange Oppositions against their own great Emolument and Accommodations: And so the Vertuous might be deprived of a fair beam of future Glory, due to their Memories for their unchangeable Resolutions, as unconcern'd in scoffing Discourses, and standing firm as Rocks against the dashes of foaming Disputants. And truly, they do much oblige us, in that they are pleased by their frets, and eager contentions, and by their fruitless and obstreperous Verbosity, to make themselves a foil, to set off the Serene Lustre of the real and obliging

performances of the Experimental Philosophers. 1

On March 16, 1668, "Phil. Trans.", Oldenburg, the Secretary, commented again on the "Obloquies of such men as prefer endless Contentions about words before the useful Works of the noblest Arts; and boast the Notions, yea, and oft-times the Cavils of pore-blind Heathen Writers, above the great and admirable Works of God". On June 15, 1668, a "Phil. Trans." review of Glanvill's book The Progress and Advancement of Knowledge since the dayes of Aristotle stated that "the Business of that Society is not to Dispute, but Work; and their Aim, not to pursue Phancyful Designs, but to free Philosophy from the vain Images and Contrivances of Fancy, by making it palpable, and bringing it down to the plain objects of the Senses". The review continued:

Taking to task that insulting Question, What have they done? He (Glanvill) gives an answer to it, which doubtless will satisfie discreet and sober men. And as for those that would have them give the Great Elixir, the Perpetual Motion, the way to make Glass Malleable, and Man Immortal, &c. or they will

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1. Parallels to this notion of the villain doing the hero a favour by opposing him and thus providing him with an opportunity for achieving the glory of victory may be found in literature from the Iliad to Peter and Wendy.

object, they have done nothing; for such, he saith, their impertinent Taunts are no more to be regarded, than the Chat of Ideots and Children.

In the dedication to the fifth volume of "Phil. Trans.", March 25, 1669, it was stated that during the years 1665 and 1666 "we were fatally interrupted by the Plague, Wars, and the horrible Conflagration of our Metropolis; yet we then made an attempt of laying some Foundation for the Improvement of real Philosophy, and for the spreading of Useful knowledge", and praise was claimed for "those Worthies, who have contrived these Philosophical Tools; and who, in despite of Calumny and Raillery, havedeserv'd as great Names.....as they, who have adorn'd the best Records of foregoing Ages". On November 15, 1669, the "Phil. Trans." review of Evelyn's book Sylva & Pomona wrote:

He (Evelyn), and other Generous persons, can in the crowd of public business, find, or make leisure to oblige all men.....whilst Morose Schoolmen, and Narrow Criticks, make it their main business to outgoe Satan in their false Accusations, disingenuous Surmises, and immodest Disturbances of the noblest endeavors and atchievements.....

Oldenburg in an "Epistle Dedicatory" of March 25, 1670 ("Phil. Trans."), asked, "what Patronage, what

Heroe, or what Genius can give safe guard against the malicious scurrility of many of this Age, who attempt to deface every vertue, and whatsoever is excellent, and particularly that which is most obliging to the Publick?" and proceeded to answer his own question:

I reply cheerfully, that the malicious and scurrilous are short-liv'd, and will soon expire in an odious snuff, or will hasten to hide themselves in shame and confusion: But Truth is mighty and will prevail; Wisedome will be justified; Vertue will in good time emerge; Knowledge will abound; Arts will flourish; and Posterity will applaud them, from whom they receive the clearest Light and the best Accommodations.....

He continued, in a most hopeful vein:

And now, let Envy snarle, it cannot stop the Wheels of Active Philosophy, in no part of the known world. Not in France, either in Paris or at Caen. Not in Italy..... In none of the Universities.....even the frozen Muscovite and Russian, have all taken the Operative ferment; and it works high, and prevails every way, to the encouragement of all sincere Lovers of Knowledge and Vertue.

Twenty-nine years later, however, in the dedication of Volume XXI of "Phil. Trans." (to Lord John Sommers), the Secretary, Hans Sloane, still found it necessary to defend the Society's activities, and to attack its attackers:

I need not tell your Lordship, who knows so much, that our Sences are not able to attain to the Knowledge, nor our Reason to Comprehend the Causes of many things which we daily see; but there is great Usefulness and Pleasure in the Pursuit of Natural Inquiries, more than equals the Trouble of the Undertaking, and the Contempt and Pleasantry of the Malicious and Ignorant.....

Indeed, "Contempt and Pleasantry" plagued the Fellows, and incited them to spirited and colourful counter-attacks, until well into the eighteenth century. Pope, assembling recipients of "titles and degrees" from the Queen of Dullness, included the ".....more distinguished sort, / Who study Shakespeare at the Inns of Court, / Impale a Glow-worm, or Vertu profess / Shine in the dignity of F.R.S." ¹ "The Tatler" " remarked:

It is indeed wonderful to consider, that there should be a Sort of learned Men who are wholly employed in gathering together the Refuse of Nature, if I may call it so, and hoarding up in their Chests and Cabinets such Creatures as others industriously avoid the Sight of. 2

and proceeded to play with the idea of "The Will of a Virtuoso," quoting Shadwell's Sir Nicholas Gim-

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1. Pope, The Dunciad, Bk. IV, ll. 567 f.
 2. The Lucubrations of Isaac Bickerstaff Esq., "The Tatler", No. 216, Thursday, August 24 to Saturday, August 26, 1710.

crack as bequeathing

.....to my dear wife One box of Butterflies,
One Drawer of Shells, A Female Skeleton, A
Dried Cockatrice.....to my Daughter Eliza-
beth, My Receipt for preserving dead Cater-
pillars.....to my little Daughter Fanny,
Three Crocodile Eggs..... My Eldest Son
John having spoken disrespectfully of his
little Sister whom I keep by me in Spirits
of Wine.....I do disinherit.....by giving
him a Single Cockle-Shell..... 1

"The Spectator", commenting on improvement of natu-
ral knowledge, said:

.....it draws Men's Minds off from the Bitter-
ness of Party and furnishes them with Subjects
of Discourse that may be treated without Warmth
or Passion. This is said to have been the
first Design of those Gentlemen who set on Foot
the Royal Society; and had then a very good
Effect as it turned many of the greatest Geni-
uses of that Age to the Disquisitions of natu-
ral Knowledge, who, if they had engaged in
Politics with the same Parts and Applications,
might have set their Country in a Flame. The
Air-Pump, the Barometer, the Quadrant, and
like Inventions were thrown out to those busy
Spirits, as Tubs and Barrels are to a Whale,
that he might let the Ship sail on without Dis-
turbance, while he diverts himself with those
innocent Amusements. 2

In Brobdingnag Gulliver killed four wasps as big as
partridges and kept only one of the stings for him-
self, saving the others for "Gresham College", and

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1. Ibid.
 2. "The Spectator", Monday, December 31, 1711.

the philosophers of the floating island of Laputa were of course Swift's parodies of Virtuosi.

All these satires and attacks, and the Society's defences against them, served one common purpose, however. They heightened general interest in the Society and its investigations; to the solid concern of the serious, they added a frothy curiosity; and thus, in the end, they helped to advance the spirit which was to destroy, among other things, nature fables - the spirit of science.

For when an idea is ripe, and its ultimate adoption made inevitable by the course of history, then any attention called to it, unfavourable as well as favourable, only hastens the progress.

In this chapter the seventeenth century English "climate of opinion" which made inevitable the destruction of the nature fables has been described, with lamentable brevity, and the character and influence of the most powerful force produced by that climate of opinion, the Royal Society, have been discussed. It has been established that for a number of reasons - the personal prestige of its members, the importance of some of its discoveries, as well as the absurdity of others, the

significance and picturesqueness of its disputes with Church, University, Literature and Philosophy - the Society in those troubled years, by arousing great interest in scientific transactions, exerted a general influence unusual for a scientific group.

In the next chapter it will be shown how that influence was used in particular, to help to kill the nature fables.

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CHAPTER VI.

DESTRUCTION OF THE FABLES.

Many of the Society's members in the seventeenth century wrote books which touched on natural history fable as well as fact,¹ and these were of great importance in affecting public opinion, but space limitations prevent discussion here of such individual efforts; this chapter will include only the considerations and transactions of the Society as a whole. References have been taken from the five primary sources: the "Philosophical Transactions", "the oldest scientific journal in the English-speaking world",² the Society's Journal Book, Birch's History of the Royal Society, Sprat's History of the Royal Society, and Nehemiah Grew's Musaeum Regalis Societatis, a catalogue of the Society's museum. In "Philosophical Transactions" were published, usually, articles, letters and book

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1. Vide especially Hooke's Micrographia and other works; Grew's botanic writings, and the books of John Ray.
 2. Stimpson, Scientists and Amateurs, pp. 65 f. "Philosophical Transactions" was first published in March 1665; the Journal des Scavans of the French academicians, oldest of all scientific journals, first appeared in January of the same year.

reviews. The Journal Book was a minute book. Birch summarized proceedings and publications for the period 1660-1688. Sprat in his general defence of the Society wrote of some transactions not to be found elsewhere. Grew described the museum specimens in considerable detail, often theorizing on current beliefs in natural history. Throughout this chapter "Philosophical Transactions" will be designated T, the Journal Book J, Birch B, Sprat S, and Grew G.

While reading this chapter it should be kept in mind that the Royal Society alone did not destroy nature fables in the seventeenth century. The scientific spirit of the time would have banished them if such a Society had never existed. The Society, which became the most potent single agent of that spirit, only delivered the coup de grâce to the fables.

It should also be kept in mind that while the Society's considerations did not usually end in disproof, many of the fables were of such an improbable nature that commonsense had already seriously affected belief in them, and any attention directed to them, even though not establishing their

falsehood, was liable to damage their credibility by arousing an interest most likely to be sceptical. Furthermore, it must not be forgotten that the fables were mostly dependent on "authority", the writings of the classic authors and their followers, and the weakening of belief in any single fable might therefore weaken faith in "authority", and all its other fabulous children; thus an attack on one such might act as an attack on all, and produce an effect far greater than could be apparent.

The Society made mention of scores of false beliefs concerning more than one hundred plants, animals and men. The list of fables considered by the Fellows in those days closely parallels the list presented in Chapter Three.¹ The entries are far too numerous and too lengthy to be presented in detail here; an effort will be made, by sampling, to recreate something of the spirit of the time in which these considerations took place and to show how the Royal Society gave the death-blow to nature

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1. Notable exceptions: Bonasus, Caprimulgus, Pegasus, Phoenix (there was one mention of a Phoenix in "Phil. Trans.", February 9, 1674 - but that Phoenix was one of His Majesty's ships), and most of the outlandish Plinian people like the Umbrella-feet and Astomi and so forth.

fables in England, in the seventeenth century. The listing, as in Chapter Three, will be alphabetical.

AMBER.

On November 19, 1666, T answers were reported to an inquiry sent to Dantzic concerning amber, "whether it be an Exudation of the Sea?", stating that amber was "a kind of fossil pitch or bitumen" whose "Veins lie at the bottom of the Sea". On May 6, 1667, T, the Society sent an inquiry to Egypt asking if amber was "the Gum of a certain Tree growing in Aegypt, or Aethiopia?" On May 20, 1672, T, "Mr. Kirkby" reported that "the chief Fisher of Dantzic had "inform'd me" that a "considerable large piece of white Amber" had been found in a lake

.....three German Miles distant from the Ocean; and since also the neighboring woods that bear none, but highly resinous trees, cannot be reasonably said to furnish such Amber, that conjecture, which imports that Amber is a bituminous fluid substance, hardened by the operations of the aqua-aerial particles upon it, may receive some confirmation from this account.

On February 5, 1673, B, Hooke "declared his opinion, that yellow amber was nothing but resin petrified". A review of a book by Thomas Bartholini, T, 5/24/75,

states that the work contains "Several Observations concerning Amber..... That the intelligent Reader upon due examination may judge, whether that substance be a Juyce of the Earth, or of a Tree". On November 28, 1678, B, Hooke again

.....affirmed.....that he was of opinion, that amber was nothing but the turpentine or resinous gum of trees, which having lain a long while in the sea or under ground was in process of time petrified, or at least hardened to that degree, in which it was found.

Grew in his catalogue, p. 344, stated, "Among the many opinions of the Original of Amber, I put this question, Whether it is not a kind of harden'd Petroleum?" On November 20, 1684, T, a book by Robert Sibbald, an Edinburgh doctor, gave it as the author's opinion that amber was cast up from "superficies" of the bottom of the sea, and Samuel Dale in another book, October, 1693, T,¹ took amber to be a mineral juice. On June 17, 1696, J, Hooke "alleged that he was certain and Could prove that Amber was nothing but Petrified Turpentine," and on the next January 14, J,

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1. Occasionally in those early years "Phil. Trans." was dated only by a month - once in a while an issue would cover several months.

Dr. Hook was of opinion Amber was from the Rosin of a Firr tree and that because it had often flyes in it. Mr. Pettiver thought the Chymicall Analysis of it yeilding a volatile Salt which no Turpentine did, showed ye contrary. Dr. Sloane acquainted the Company that Dr. Love Morley.....believed both Amber and Amber grease to be natural Bitumens wch. being soft might receive insects into them and afterwards harden.....

On January 20, 1697, J,

The Electricity of Amber or drawing of Straws to it when rubbd was thought by some to be a property peculiar to Amber and not to rosins but Dr. Hook assured the Society that hard wax, Brimstone and Colophonia and jet would draw light Bodies to them as well as Amber.....

On May 19, 1697, J, "Dr Hook entertained the Society with a Curious lecture about Amber..... He was of opinion that Amber had its original from trees for 6 reasons." His six reasons:

Because it was always found in small peices or lumps as Gums..... Amber was much lighter than Mineral or Fossil Substances..... Amber is an uniform or continual Mass and neither plated, prismatical, nor likely to be coagulated as most fossil substances..... Turpentine buried and lying long in the Earth, being distilled yeilds an Oyl very like Oile of Amber..... He knew no mineral Substance so light which reced (sic) soe good a pollish, but many Vegetable ones..... He thought there were many Instances to be mett with of petrified vegetables analogous to such petrefaction of Resin into Amber.

In February, 1699, J, a book by "Signior Boccone" tried "by many Arguments to prove, that Amber is nothing else but Naphtha, or Oleum Petroleum, coagulated or condensed".

AMBERGRIS.

On October 21, 1663, B, "Mr. Colwall" stated:

Ambergrise is chiefly found in the South-seas.....and those men do aver, that the grey amber (sic) is the excrement of a very great fish; and the white is evomition: and that the natives observing such fish to visit the coast, do diligently take notice, when they see them duck their heads, and void backwards; or erect their heads, and vomit forwards: and thereupon visit, with their small boats, the adjoining rocks and shores, where they find it in huge great lumps, lay it in the sun to harden it, and then cutting into small pieces, divide it into respective shares...

An inquiry was sent to Sir Philberto Vernatti, "resident in Batavia in Java Major," ¹ requesting him to "endeavour the getting of more certain Knowledge, what it ("ambergrease") is; being reported to be bred in the Bottom of the Sea like to a thick Mud?"

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1. Sprat, p. 168. Sprat does not date this inquiry, but "Phil. Trans.", in the issue of January 11, 1669, contains other "Answers to Inquiries which were recommended by Sir R. Moray to Sir Phil. Vernatti, President (sic) in Java Major".

He replied:

The best that is in the World comes from the Island Mauritius: and is commonly found after a Storm. The Hogs can smell it at a great Distance; who run like mad to it, and devour it commonly before the People come to it. It is held to be a Zeequal Viscosity, which being dried by the Sun, turns to such a Consistence as is daily seen. Father Myavines Isaac Vigny a French Man in Olerontold me, he sailed once in his Youth through so many of these Zeequalen, as would have loaden ten thousand Ships..... His Curiosity did drive him to take up some of those, which being dried in the Sun, were perceived to be the best Ambergrease in the World..... Where this Place is situated, I do not know; but Monsieur Gentillot, a French Captain in Holland, can tell you. 1

In "Phil. Trans.", 10/22/66, it was inquired, "How far storms reach downwards towards the Bottom of the Sea? What power the Sea hath to produce or hasten Putrefaction.....to eject dead bodies,² Succinum,³ Ambergris?" A review of a book, Historia Ambrae, by "Justo Klobio, D. in Academ. Wittenbergensi," T, 10/21/67, stated:

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1. The Oxford English Dictionary contains no word like "zeequal" or "zeequalen". The Dutch word "zeekwal" (plural, zeekwallen) means jellyfish.
 2. For the fable that the sea rejects dead bodies, see SEA, Chapter Three.
 3. Succinum was amber. So was "electrum", the Greek word from which our word "electricity" is derived. Early experimenters were impressed by amber's ability to attract objects when rubbed.

This Author reckons up 18 Opinions concerning Ambergreese, and having examined every one of them, he embraces that, which holds, that it is the Dung of a Bird, (called in the Madagascar Tongue Aschibobuch:)of the bigness of a Goose, curiously feather'd..... There is another Opinion among the said 18, for which the Author hath a good inclination, but yet dares not embrace it, viz. that 'tis the Excrement of a certain kind of Whales. If this Amber were but in those other places, where there is good store of such Whales, it seems that would make the Author Relinquish the former Opinion. This puts us in mind of a Relation, to be met with in Purchas.....of a sort of Whale, called Trompa, having but one Trunk on his head.....teeth of a span long, and as thick as a mans Wrist, but no Finns, In his Head is the Sperma Ceti.....and in his Entrails, the Ambergreese, being in shape and colour like Cowes-dung.....

Three weeks later, T, 11/11/67, the Society directed an inquiry to Greenland "particularly to observe whether that kind of Whales they call Trompa, have in their Heads the Sperma Ceti, and in their Entrails the Ambergreese.....?" ¹ On October 6, 1673, Boyle wrote that a friend had sent him, from a Dutch manuscript he was translating, a "Physical Observa-

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1. The Society sent inquiries to many far countries, by many seafarers, as well as by its own members on tour. "There will scarce a Ship come up the Thames, that does not make some return of Experiments," Sprat declared (p. 86). Often, however, as in this case of the inquiry concerning the Trompa, answers were not received, or if received, not noted.

tion" that

Amber-Greece is not the Scum or Excrement of the Whale, &c, but issues out of the Root of a Tree, which Tree how far soever it stands on the Land, alwaies shoots forth its roots towards the Sea, seeking the warmth of it, thereby to deliver the fattest Gum that comes out of it: Which tree otherwise by its copious fatness might be burnt and destroyed. Wherever that fat Gum is shot into the Sea, it is so tough, that it is not easily broken from the root, unless its own weight and the working of the warm Sea doth it, and so it floats on the Sea.....

On November 20, 1684, T, Edinburgh's Dr. Sibbald in his book Scotia Illustrata hazarded the opinion that ambergris is cast up from the sea like amber, from the same "superficies" at the sea's bottom, and in another book, observed that whales are "great Lovers of Ambergris, and that it is sometimes found in their Stomachs". (T, 11/93.) On June 22, 1685, T, "M.I." wrote, "A friend of mine, Mounsieur de Villermont.....promises to shew me, that Ambergrise is nothing but the wax, mixt with the honey (of West Indian bees), which falls into the Sea, and is beat about in the Waves between the Tropics" In September, 1697, T, a letter from "Mr. Robert Tredway to Dr. Leonard Plukenet, from Jamaica," declared:

I Shall only at present let you know the Account I received from Ambergriese Ben, for so the Man is called from the vast Quantity of that valuable Commodity he found Two Years ago..... That which I have to inform you, is the Way how 'tis produced: viz. from a Creature, as Honey or Silk; for I saw in sundry Places of this Body, the Beaks, Wings, and part of the Body of the Creature which I preserved some time by me, and this ignorant Fellow.....has seen thee Creature alive; and he adds, That he believes they swarm as Bees, on the Sea-Shore or in the Sea. This account is very different from what I ever met with, so I thought fit to Communicate it.....

AMPHISBAENA.

On April 12, 1668, B,

Dr. Pope related, that Sir Andrew King had assured him, that he had met in Spain in his own lodgings, with several amphisbaena's, and opened both mouths of them, and taken seed out of them. Dr. Goddard remarked, that perhaps these serpents might be monstrous, composed of two imperfect serpents growing together in the middle.

Sir Philberto Vernatti, answering another of Sir Robert Moray's inquiries to Java, T, 1/11/69, reported:

There are indeed such Serpents in these parts, which have an Head on each end of their Body, called Capra Capella. They are esteem'd Sacred by these people, and fortunate to those in whose house and lands they are found; but pernicious to whomsoever doth them harm. I

would have sent one, but could get no man that would kill them.

ANT.

On February 22, 1675, T, it was inquired

Whether Ants or Pismires will be driven away by scattering the powder of Brimstone and Origanum or wild Marjoram? And whether the same effect will follow upon the smoaking of storax or assa faetida; or upon the smook of some of those creatures themselves burnt? 1

ANTIPATHIES AND SYMPATHIES.

On March 11, 1667, T, it was inquired of Suratte "Whether the Rhinoceros have such an Antipathy against Elephants, as is commonly related", and on November 20, 1671, T, "Goth. Voigtii" in his book on the delights of natural science spoke of "the Love between Wolves and Sheep". According to the reviewer, he declared

.....the wolve's tearing and devouring of sheep to proceed not from Sympathy or Love, but from the Contrary; it being found, that Wolves often worry more sheep, than they can devour;

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1. This question was among "Divers Rural and Oeconomical Inquiries, recommended to Observation and Tryal". But answer, as in the case of the Walrus and the Carpenter, "came there none".

there appearing also a manifest aversion betwixt them from the sheep's flying away from wolves, instead of which there would be a consociation, if there were a sympathy betwixt them.....

On August 20, 1684, T, "Francisco Moncaeio" in a book on magic stated that

.....the strange antipathy (if true) between a cock and Lion may be accounted for, either from the disproportion of the sound to the Lions ear, as the grating of knives upon stone is unpleasant to us; or as the noise of balls, or singing, sets dogs an howling: or because in Africa there are no cocks, or lastly, because though in other countries, as in Thessaly and Macedonia there are cocks, yet they never crow.

BARNACLE GOOSE.

The Society took quite an interest in this old legend. On February 25, 1661, B, Sir Robert Moray was "desired to communicate in writing an account of the bernacles," and the next March 6, B, Sir Robert, having been chosen president of the group and "having given in, probably this day, his relation concerning the bernacles, it was registered on the 8th of March," and printed, to the subsequent embarrassment of the Fellows, in "Phil. Trans.", February, 1678:

In the Western Islands of Scotland.....I saw lying upon the shore a cut of a large Fir-tree..... On the parts that lay next the ground, there still hung multitudes of little Shells; having within them little Birds perfectly shap'd, supposed to be Barnacles..... These Shells hang at the Tree by a Neck..... not unlike the Wind-pipe of a Chicken..... from which it seems to draw and convey the matter which serves for the growth and vegetation of the Shell and the little Bird within it. This Bird in every Shell that I opened, as well the least as the biggest, I found so curiously and compleatly formed, that there appeared nothing wanting, as to the external parts, for making up a perfect Sea-Fowl: every little part appearing so distinctly, that the whole looked like a large Bird seen through a concave or diminishing Glass, colour and feature being every where so clear and neat. The little Bill like that of a Goose, the Eyes marked, the Head, Neck, Breast, Wings, Tail and Feet formed, the Feathers every where perfectly shap'd, and blackish colour'd; and the Feet like those of other Water-fowl, to my best remembrance. All being dead and dry, I did not look after the inward parts of them.....nor did I ever see any of the little Birds alive, nor met with any body that did. Only some credible persons have assured me, they have seen some as big as their fist. 1

On June 3, 1667, T, in an account of Kircher's book China Illustrata, there was mention of "leaves of certain Trees.....which falling into the water,

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1. Heron-Allen, a Fellow of the Royal Society, in his book Barnacles in Nature and in Myth, p. 70, noted that it was "disconcerting.....to be compelled to record" this account written by a former P.R.S.

become like black Birds: which he ascribeth to the Seminal parts of some Eggs, broken on those Trees, fill'd with Birds nests".¹ A review of a book of experiments by Francisco Redi, physician to the Grand Duke of Tuscany, whose excellent work in discrediting the myth of spontaneous generation will be discussed later (as will his long dispute with the Frenchman, Charas, about the nature of viper poison), which appeared in "Phil. Trans.", March 25, 1673, stated that the author "cannot believe..... that the Leaves of certain Trees are metamorphos'd into Swallows....." Willughby's Ornithology, according to a review of December 27, 1675, T, stated:

The Bernacle or Clakis, of the Goose-kind, is not bred out of the rotten boards of ships,

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1. The Jesuit Athanasius Kircher was distrusted by Protestants because of his religion but read with interest because of his many marvels. In this same book he spoke also of wild men, colour-changing roses, wool-bearing hens, rivers cold on top and hot below, sea-cows "going often ashore, and fighting with the Land-Cows", and fig leaves big enough to "wrap up a man in". John Webster in Metallographia, published in 1671, called him "Rhapsodist Athanasius Kircherus, with all his querks". A "rhapsodist", according to Johnson's Dictionary, was "one who writes without regular dependence of one part upon another".

nor of such fruit fallen from Trees into the Sea, nor of Sea-shells; there being no such thing as unequivocal generation in Animals; and those Barnacles being known by the experience of credible Observers to lay and hatch Eggs as other Birds do..... 1

Grew's Catalogue. pp. 148 f., described the "Flat Centre-Shell" thus:

Balanus compressa. Commonly called the Barnacle-Shell; and *Concha Anatifera*. Because supposed to be the Egg of the Barnacle. And by some it is confidently deliver'd, that in the Orcaes there are certain Worms grow in Hollw-Trees, which by degrees obtain the Head, Feet, Wings and all the feathers of a Water-Fowl, which grows to the bigness of a Goose..... And with respect to so worthy a Person as Sir Robert Moray (who never meant to deceive) I my self was once induced to publish his Description of the same. But having examined the Shell it self, I am of Opinion, That all that is said of a Bird, is fabulous.

A review of Robert Sibbald's book Scotia Illustrata,

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1. Willughby was a good and cautious observer, disinclined to accept anything on faith, although he did admit "flying Serpents" of Libya into his list of creatures. Of the "Barnacle", he said, precisely, "What is reported concerning the rise and original of these birds, to wit, that they are bred of rotten wood....or of certain Palms of trees.....or.....of a kind of Sea-shells.....may be seen in Aldrovand, Sennertus.....Meyerus.....and many others. But that all these stories are false and fabulous I am confidently perswaded....." (Willughby, The Ornithology, p. 359.)

T, 11/20/84, said:

He has annexed a discourse about the Scotch Geese, the Fable of which he confutes by a description of the Concha Analifera (sic), which is a perfect animal of it self, and allways remains so; and asserts that those Geese are known to build and lay Eggs, like other Fowl; though not in that Country, in which they only appear, in Autumn and Winter. Anatomy also discovers in these all the Vessels for propagation of Species that are found in other Birds.....

A letter from Dr. Plot to Mr. Charles Leigh, B,
11/26/84, said:

I have.....taken notice of the generation of barnacles, the manner of which, as 'tis commonly believed, I look upon to be very erroneous. It is supposed by seamen, that when any ships come from the Indies, their vessels produce some unctuous matter, which is the cause of barnacles, for they always observe them as they come from thence.....but were this a sufficient argument to prove the generation of barnacles after this manner, they might as well infer, that oysters and muscles are generated after the same manner..... That therefore, which they call a barnacle, I look upon to be a shell-fish, and not a bird, for these reasons, 1st, Because, when not covered with water, they immediately die. 2dly, The flesh and smell of them is exactly like that of fishes. 3dly, That, which resembles the head and neck of a barnacle, and which by the seamen is looked upon to be such, is, I am well satisfied, (because it is not joined to the body) not any such thing. 4thly, Those, which by them are esteemed wings, are only little claws wound up in spiral lines. And lastly, there cannot any seaman say, that he ever saw any of these turn into any kind of

bird, and swim in the water; though some do confidently affirm, that they have seen them with feathers coloured like those of the barnacles: as for my part, I have not yet seen any such thing, and shall therefore, till I do see it, think they have better fancies than judgments, that affirm it.

On June 22, 1685, T, John Ray in a letter declared:

.....I had no sooner seen the Cases of the Male, and Female Macreuse.....but instantly I found that the Macreuse was no stranger to me, though unknown by that name; I was very much pleased to be so suddenly rid of my long continued scruples about it, and not a little surprised, when I found it to be another kind of Bird than I imagined.... 1

And on the same day, T, Dr. Tancred Robinson summed up the barnacle goose situation in an article which stated:

.....Gesner himself (though the most learned, diligent, and faithfull of any that ever meddled with the History of Animals,) was led into the first error by Giraldus, Boethius and Turner; Sir Robert Moray fell into the third and last mistake.....the learned Sr. Robert Sybbald, and Monsieur Graindorge have indeed confuted these equivocall Generations of the Bernacle and the Macreuse..... That the Bernacle and Macreuse are both oviparous, is beyond all

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1. Ray on a trip to Malta in 1664 collected several "sea-tortoises", one of which had "two great bunches of those they call Bernacle shells growing to his back," and noted: "the opinion of a bird breeding in them.....is false and frivolous". Cited by Raven, John Ray, p. 291.

doubt; the Anatomy of their parts serving for Generation; many late Voyages into the North; their laying Eggs; and sometimes breeding among us, are all evident proofs thereof..... 1

BASILISK.

Grew's Catalogue, p. 376, listed "the Picture of a Basilisk. Pretended by those that shew it, to be a real Animal so call'd. But it is an Artificial Thing, made chiefly of the Skin of the Raja, and the Legs of a Dodo, or some great Fowl".

BAT.

The "Phil. Trans.", 6/3/67, review of Kircher's China Illustrata spoke of "Bats, of a vast bigness, eaten by the Chinese as a delicious meat", and a review of a book called Miscellanea Curiosa Medico-Physica "very lately begun in Germany by a Company of Ingenious Philosophers", February 20, 1671, T, mentioned "a way of Dwarfing men, by anoint-

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1. Heron-Allen writes, op. cit., p. 108, "the Barnacle-myth was as well known in France as it was here, and on its attaining to its final discredit became known as 'l'histoire d'un canard' - which in its shortened form survives to this day." The Oxford Dictionary does not list the barnacle goose myth as one of the possible origins of the phrase "un canard".

ing their Back-bones, in their very infancy, with the grease of Moles, Batts, and Dormice". Grew's Catalogue, p. 54, said "in the same Island (Brasile), there is a sort of great Bat, that as Men lie asleep with their Legs naked, will suck their blood at a Wound so gently made, as not to awake them: whereby they are oftentimes in danger of bleeding to death".

BEAN.

On May 12, 1693, J,

There was Read a letter of Mr. Cole to Mr. Waller giving an account of some of his late studies, particularly about a Vulgar Error of a Bean changing on the Leap Year the position of its Eye or place where it is affixed to the podd.....

BEAR.

On July 19, 1669, T, in an account of a book by Parisians who had dissected various animals including a bear it was stated

The Bear hath a very particular structure of his Leggs, and their substance, very good to eat, is a kind of thick fattish ligament, out of which may possibly issue that moisture, which Authors say is sucked by the Beast for his nourishment in winter..... The Brains they observed to be 4. times bigger, than that of the Lyon they open'd.....

A book, Deliciae Physiciae, by "Goth. Voigtii", T, 11/20/71, discussed "divers curious subjects" including "the licking of new-whelp'd Bears by their Dams" and concluded that bear cubs are not born

.....unshapen and imperfect.....those young creatures being in truth found no more unfashioned and defective in their kind, than others in theirs; and the licking of the bear being common to her with other animals, that do the like to their young ones.

A book by "Joh. Nicolai Pechlini M.D." T, 7/18/76

.....discourses of some Quadrupeds hiding themselves in caves during winter, as Bears, Hedge hogs, &c. observing, that, what-ever the tradition be of Bears sleeping all winter, and sucking now and then their paws, it will be found, that they sleep soundly at first for a good while, but afterwards awaken and live upon some provision they have stored up for that dead time of winter: And, as to the oleous moisture sweating out of the tubulous Channels of their Feet, that hath no other use, than to soften and smooth, by being licked up, the Sinuosities of the stomach and bowels that had by long abstinence been much corrugated.....

On May 2, 1678, B,

.....mention was made of the foot of a bear, which by Steno was observed to be much fuller of glands than that of other creatures: and this was supposed to be the reason, why bears were observed to suck their feet.....as containing a liquor laid up by nature.....

Grew, p. 12, listed without comment the "foot of a

bear", and a book by Francisco Moncaeio, Disquisitio de Magia divinatrice & operatrice, T, 8/20/84, said Norwegian bears are called out of their dens by "bad language".¹

BEAVER.

In the Parisian dissectors' July 19, 1669, T, account of their findings it was noted that in the beaver, or "castor", the "bladders containing the Castoreum" were "distinct from the Testicles". On July 15, 1672, T, "John Josselin Gent." in a book of observations of "New-Englands Rarities" spoke of "a little beast call'd a Muskquash", which "hath Cods senting that as sweet and strong as Musk, and lasting thus a long time, wrapt up in Cotton-wool....." Thomas Burnet remarked in a Thesaurus of Practical Medicine, T, 11/18/72,

.....that the force of Castoreum is such, that

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1. The Disquisitio, which did not specify what "bad language" is most effective with bears, also gave "some account of that natural language Adam was supposed to have had, by the very elocution of which alone, he exercised the dominion over the rest of the Creation", and "of breaking open doors by the word hephatha", and concluded with the reflection that "all effects, how surprizing soever, are merely natural".

about the Isles of Fero, the Fishermen, when their Boats are endangered by Whales, throw some of that substance into the Sea-water, which being beaten with it, the Fish immediately sinks to the bottom.....

On July 18, 1676, T, "an extract of a Letter &c. from Dublin", author not named, stated

.....that the Testicles of the Animal called Musk-quash do smell strong of Musk.....is most certain: For I have known some of them kept a long time in ones pocket, till they were become hard and black, and yet smelt as strongly as at first, which, in my opinion, was nothing inferiour to the scent of that, which is commonly sold for Musk in the shops. I remember, that one of our Seamen, being laid to sleep too near the fireplace, with one of these dried Testicles in his pocket; it happen'd that a coal burn'd through breeches and all to it, and made so great a scent of musk, that he might easily have been smelt a good way off..... This Animal deserves to be further inquired into.....

Grew, pp. 15 f., listed without comment a "fore-tooth of a Bevir", and a "tail of a Castor or Bevir".

On November 20, 1683, T, Edward Tyson submitted a report on the anatomy of a "Mexican Musk-hog", remarking

This I first took notice of, in Polecats; that just at the extreame of the Rectum, were placed two bags, filled with a crasse, and whitish liquor; whose stink was so very great, that I could not well endure the room..... The same I have observed in abundance of other Animals..... Those bags in the Civet-Cat.....are nothing but the same. As are likewise those

of a Musk-quash mentioned by Josselin in his history of the Rarities of New-England, For they are not the Testicles of that Animal..... For having seen the Skins here in Town; and those Musk Cods; I find them to be only the Scent-bags. So the Castoreum we have in our Shops, is not the Stones of a Beaver; as formerly reputed; but of the same nature altogether with our Scent-bags. 1

A book, Castorologia, written by Joannes Marius and "enlarged by Joannes Francus", according to the "Phil. Trans." review of December, 1685,

.....describes the Beaver (for it is not our English Badger, for which the Author mistakes it) to be an Animal about the bigness of a Cat, amphibious..... His forefeet are like a Dogs, and his hinder like those of a Goose; his tail seems to be an intire Fish, which he always keeps wet, suffering several inconveniences when it is dry. Between its hinder legs grow two bags, which contain the Castoreum; these many Authors took for the Testicles of the Animal, till Rondeletius first undeceived the world, & proved them by Anatomy to be only bags for this very substance..... Its Skin.....is commended in the Colick, Hysterical pains, Madness and other distempers..... The blood is sovereign in the Epilepsy. The Fur is astringent..... The teeth are used as Amulets for Children in breeding the teeth..... The chief thing of use about it is the Castoreum.....

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1. The same Edward Tyson, M.D., F.R.S., declared, J, 12/24/94, "that Vesinglius does assert, That in Egypt it is a Common thing for men to give Suck to the Children in the absence of the Mothers....."

This book went on to enumerate the virtues of castoreum, declaring it "one of the best Medicines in Nature....." On March 31, 1686, T,

Mr. Houghton shewed a part of an animal smelling strong of musk, and said by the owner thereof to be a musk-cod. It was cut in two places, and seemed to have within it two cavities, as the testicles had been quite dried up. Mr. Hill said, that it was an usual fraud to tie up parts of the skin of the musk-deer, all which smell of musk, into the likenesses of cods; but that in fact it was not the testicles of that animal, that yield the scent, but a gland growing under the belly.

"A Receipt for the Curing of Castorium, according to the method us'd in Russia," T, 6/91, stated: "Take the Beaver Stones and get the Milk out of them as clean as you can, then set upon the Fire a Skillet or Kettle with Water", then boil, smoke, and dry -- "after which they may be pack'd up in a Cask or otherwise for Transportation".

Samuel Dale in a book on pharmacology, T, 10/93, said musk was "an Excrementitious Succus.....secreted in its proper Follicule near the Anus of an Animal of the Dog-kind, and not the Sperm," and "Castor" was the "Scent-bags adjoining to the Intestinum Rectum, and not the Testicles of the Beaver". John Clayton in an "Account of Virginia", T, 5/94,

noted that

Beavers.....are very subtil Creatures, and if half of the Stories be true that I have been told, they have a very Orderly Government amongst them; in their Works each knows his proper Work, and Station, and the Overseers beat those Young Ones that loiter in their Business, and will make them cry, and work stoutly.....

BEE.

Grew in his catalogue, p. 155, stated that "In windy Weather, Bees often hold a little stone in their hinder Feet; which serves as a Ballast to make them sail through the Air more steadily..."¹

BEETLE.

Grew, p. 163, listed "The Stag-Beetle" and said "The Horne of this Insect being set in Gold,

1. In the Chapter Four discussion of "Bee" it was noted that Swammerdam scouted this pebble-ballast story. The fable still lingers on, though, together with many other false bee beliefs. Some bee legends are not untrue, however, despite their apparent improbability. Edwin Way Teale in The Golden Throng states that the old belief that bees are aroused by human breath seems based on fact, and advises beekeepers to hold their breath when in close contact with their charges.

and so worn as an Amulet, are said to be of excellent force in easing of Pains, and against the Cramp". A letter from Leeuwenhoeck, T, 5/98, stated

I have, last Summer, shewn to several English Gentlemen, the Multiplicity of Eyes that are to be seen in the Tunica Cornea of a Beetle, that is called the Eye. This Sight was very strange to the said English Gentlemen; because, that if one will reproach a Man with Blindness, or Dimness of Sight, they use to say in English, You are as Blind as a Beetle, because they reckon a Beetle to be Blind.....

In October, 1698, T, Benjamin Allen gave an account of a

.....small Beetle, which makes a Ticking or distinct Beating, resembling the Noise of a Watch, being rarely heard, and not known, and has obtain'd the name of a Death-Watch, which yet I have known to be heard by many, where no mortality follow'd; and particularly by my self, who have taken Two of the same, Seven Years since, without any Death following that Year.

BEZOAR.

The Society debated the merits of bezoar stones often. Only the more significant entries are here cited.

Sir Philberto Vernatti replied to an inquiry to Java, S, p. 171,

.....in that Country, but very seldom, there grows a Stone in the Stomach of a Porkapine, called Pedro Porco; of whose Virtue there are large Descriptions..... There is Sophistication as well in that as Bezoar.....and every Day new Falshood, so that I cannot well set down here any rules, but must be judged by Experience. A false one I send you.....

On August 5, 1663, B,

Dr. Fairclough.....shewed a certain stone (pretended to be an oriental bezoar).....but being rubbed upon fair white paper.....left no greenness upon it. He was desired to produce this stone again at the next meeting, that it might be looked upon with a microscope.....

Three weeks later, B,

Dr. Ent suggesting, that a true natural bezoar put into water would have the same weightafterwards.....the oriental bezoar produced by Dr. Fairclough, of twenty ounces and an half, was weighed, and then dipt in water, and found to weigh afterwards three quarters of a grain less.....

On March 25, 1673, a review of a book by Francisco Redi said

This Learned and Observing Author, desirous to examine many Traditions about Natural things, takes occasion from certain Snake-stonesbelieved to be a sure Antidote against..... venomous animals, when applied to the wound, to which 'tis said it will stick very fast, till it have imbibed the poison; which done it will fall off; This being invalidated by the Author upon many Tryals, he affirms to have made.....

On November 14, 1678, B, there was a "discourse concerning Bezoar stones", of which "vast multitudeswere brought over into England.....many of themprobably counterfeit," and Mr. Colwall said he had tested them with a red-hot needle. "Those, which were counterfeits, would melt and fry; whereas those, which were true, would not". On May 27, 1680, B, Mr. Aston said the serpentine stone was factitious, but

Dr Tyson gave an account of his trial of a serpentine-stone, by applying it to the hand of a servant bit by a viper. He also affirmed, that this stone being applied to an hydropical leg was found to stick to it; and that he had known and used it in an erysipelas after a fever..... It was ordered, that some trials should be made with the stone.....

Grew, p. 52, listed a "Serpent-Stone,

.....said by some to be factitious. By others, to be Natural Animal Stone..... Of a substance soft and friable, like the Oriental Bezoar. And in like manner, as the same Stone, is easily dissolved with any Nitrous Spirit dropped upon it Which to me is an argument that it grows within some Animal: it being the nature of most Animal-Stones, to be dissoluble only by Nitrous Spirits. Sir Philbert.....saith, That if it be laid to a Wound, made by an Venimous Creature, it is said to stick to it, and so to draw away all the Venime. And the like I have heard affirmed of the same Stone by a Physitian of Note in this City.

BIRDS.

On December 24, 1662, B, Mr. Hoskyns "communicated his Inquiries to be sent to Iceland", among them queries as to "whether there be seen in baths, whose heat is not sufferable by one's hand, dive-doppers swimming up and down", and whether "near the middle of the isle is.....a lake that kills the birds that fly over it," and on May 6, 1667, T, among inquiries for Hungary and Transylvania it was asked "whether there be in Hungary an Avernus, that exhalet almost alwayes such poysonous Steams, that Birds flying over it, do oftentimes fall down, either stupified, or quite dead". Sir Robert Southwell in a long discourse on water, B, 4/8/75, wrote:

.....and now, perhaps, it will not seem less wandering than the rest of this discourse, if we get up into the air, and consider the way of birds over great seas..... Supposing that birds can find their way over seas where they cannot see from shore to shore, the question is, by what marks they direct themselves?.... I conclude therefore, that it must be by the ground or bottom of the sea appearing through the water, and giving several colours to the same....

In a "Description of the Island Hirta", T, 2/10/78, Sir Robert Moray declared

An ordinary way of killing the Fowls in the Mist is this, Some of these Fellows lie beside the Door of the little Houses.....flat upon their backs, and open their Breasts. Which, when the Fowls perceive, they sit upon them, and are presently catch'd, and their necks broke. One Fellow has kill'd hundreds of Fowls in one night, after this manner.....

Dr. Tancred Robinson wrote, T, 6/22/85,

I saw upon the Mare Mortuum, and the Lake Avernus.....many.....Waterfowl feeding upon and flying over that water, reported by many of our own, as well as forein Writers, to kill Birds at a distance..... But peradventure the Poysonous Steams (if there are any peculiar to that Lake,) sometimes vanish, and return again, or else may be alter'd by new Effluviiums intermingled with them.....

In January, 1694, T, a review of a book by Leonardus Capuanus of Naples stated that he believed "deadly lakes kill only the Birds that fly over them" because birds need purer air than other creatures, and opined that Lake Avernus "formerly from its deadly Quality dedicated to Pluto" had become harmless to birds because "the Mortal Vapours formerly penetrating these Waters, are now burnt out....."

BIRD OF PARADISE.

On June 11, 1662, B, "the lord Berkley, of Berkley Castle, presented the society with a bird

of Paradise, having two feet....." On February 22, 1675, T, it was inquired "whether hanging up the skin of a Paradise-bird in a shop, or putting it among cloath, will secure them from Moths," and "More Observations of Monsieur Taverniers Voyages", T, 12/14/76, declared that the book said "that the Birds of paradise eating this fruit (nutmeg), are intoxicated therewith, and fall down dead upon the place; whereupon Emmets come and eat off their legs, and other parts....." On February 28, 1680, B, among "Rarities procured by Mr. Hook from (first name missing) Whistler, Esq.," was "A decayed bird of Paradise" - with no mention of feet, decayed or otherwise. Grew, pp. 56 f., listed a bird of paradise in the museum collection, called the alleged apodery a "silly fancy", and continued:

It is likewise commonly thought.....that those two long Quills that grow upon the top of this Birds Rump, being at his pleasure twined or wrapped round about the boughs of Trees, serve quietly to suspend him. Whereas, as Mr. Wray hath so rightly observed, not being muscular, it is impossible they should be of any such use. His hooked Claws shew him to be a Bird of Prey; and he ordinarily flys at Green-Finches, and other little Birds, and feeds on them. 1

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1. He does not. He eats seeds, fruits and insects.

In June, 1693, T, Grew in a discussion of humming birds (q.v. infra) scoffed at the notion that these little birds feed "on some Juice" and said such a theory was as absurd as the belief that the bird of paradise had no legs.

BLOOD.

"Goth. Voigtii" in his book Deliciae Physi-
ciae, T, 11/20/71, "entertains his Readers with
divers curious subjects, such as are the Bleeding
of persons killed, at the presence of the Murtherer",
and "shews it to be a very dubious and dangerous
inference....."

BUFFALO.

On November 20, 1676, T, a review of a
book on "ophthalmology" by "William Briggs A.M. of
Cambridge Univ." stated

The cause, why some Animals, as Turkies
and Buffalo's cannot endure the sight of Red,
he conceives to be, that the rays of light are
thence cast with a too rapid motion upon their
animal spirits, and thereby enrage them; there
being required a due proportion between the

motion of the Spirits and the Lucid rays..... 1

CAT.

On July 27, 1687, J,

It was enquired whether there were any emission of Light from the Eyes of Catts to help them to see in the dark as in Glow wormsbut it was the opinion of the company, that in Catts, owls and such like Animals the extraordinary faculty of seeing in the dark comes from the great dilatation of the Pupilla of the Eye, Mr. Hook said that the light seen in the Eyes of Catts is rarely found, but when the Catt is frighted or elce very earnest after her prey.....

CHAMELEON.

On October 9, 1661, B, "a living chameleon was presented to the society from Dr. Clayton", a fortnight thereafter "Dr. Goddard (was asked) to give in writing a brief account of his observations made in the dissection of the chameleon," and a week later he read the observations, which appeared

1. This author was also of opinion that when we "lift up our eyes" the pupils dilate and admit more rays, which is why "the Stars do appear less about the Meridian, than in the Horizon". He thought that cats could see in the dark because animal apirits "distended" the "membrans" of their eyes.

in "Phil. Trans.", February 10, 1678. He commented on the change of colour of the lady chameleon and declared:

Her tongue.....was easily drawn out..... to half the length of her Body, being round and full toward the end, like a Pestil, with some cavity at the extremity: having a Bone about half the length of it..... She hath Teeth plainly to be felt and seen above and below, on the whole circumference of the Jaw.....

Dr. Goddard did not, however, speak of stomach contents, nor speculate on the chameleon's diet. On July 19, 1669, T, an account of the book of dissections performed on a chameleon and other creatures by some of the "ingenious Philosophers" of the Royal Library of Paris stated:

His (the chameleon's) Tongue being furnished with and fastned to a long tromp, serving to lanch it out, for the taking of flyes, on which he feeds, and not on Air alone; the Observers having found many flyes in his stomach and Guts..... By which Observations it appears, that.....Orators have lost those pretty subjects to exercise their Eloquence upon..... 1

On October 26, 1672, B, Lord Henry Howard answered from Barbary the inquiry "whether the chamelion

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1. The other "pretty subject" lost to the orators by the Parisian experimenters' dissections was the myth that chameleons turn all colours but white.

dropping a slime on serpents kills them" thus: "We could hear of no such thing." Grew, pp. 40 f., listed one chameleon, by nature "perhaps sullen and humerous", with no speculation concerning its other possible habits and abilities.

CORAL.

On November 6, 1665, T, a review of Kircher's Mundus Subterraneus spoke of "whole Forrests of Coral at the bottom of the Red Sea". On April 25, 1670, T, appeared an account of another book, Coraliorum Historia, by "Joh. Ludov. Gansi M.D.", which stated:

This Author (asserts).....that Coral is originally a Mineral, and a kind of precious Stone.....form'd out of a glutinous Juyce, which being turned into Stone by a salt..... riseth up in the form of a Shrub, the salt being the cause, that maketh Plants spread into branches.....

Boyle, after a tract on "The Saltness of the Sea", T, 10/6/73, referred to "that Stony plant, Corall". On December 22, 1673, T, a "Monsieur Guisony" was reported as declaring that coral "is so far from being a Plant, that 'tis a meer Mineral, composed of much Salt and a little Earth", and on August 22,

1685, T, a treatise on "physic" by Michael Ettmuller concluded

.....coral.....to be a stony concretion in form of a Shrub, generated from a nitro-saline mineral juice impregnated with a sulphureous clammyness elevated by the subterraneous heat, through the pores of the bottom of the Sea where by the cold and saltnessit is congealed.

CRICKET.

Grew, p. 159, listed a "Baulme Kricket, Cicada.....This Insect, saith Moufet after others, feeds only upon Dew; and hath no Excrement, which is most unlikely".

CROCODILE.

On May 6, 1667, T, among inquiries for Egypt it was asked

.....whether the Ichneumon, or Aegyptian Water-Rat can kill a Crocodile by skipping into his Mouth, and gnawing his way out, as Old Writers affirm? Whether it be true, That the Arabs can Charm the Crocodiles; or Whether there be on the Nile's side any Talismans, or Constellated Figures, beyond which the Crocodiles cannot pass, 118

as some would make us believe? 1

The aforementioned Voigtii book of 11/20/71, T, discussed the "Tears of Crocodiles" and the author decided these so-called tears were "meer moisture or aqueous drops" rather than real tears, which he "adscribeth to Rational creatures alone, as only capable of true grief". On October 26, 1672, B, Lord Henry Howard, having been asked among inquiries for Barbary whether there was "such a bird, that picks out the worm from the crocodiles teeth, which having a little sting in its head, causeth the crocodile, when he would swallow it, to open his mouth and let it escape", replied, "No crocodiles in this part of Africa". Grew, pp. 41 f., 45, listed a crocodile

.....which in the Book of Job is called the Leviathan, and hath been commonly taken to be the Whale; but falsly.....Nature, saith Aristotle, hath denied a Tongue to this Animal. Which Sir Thomas Brown takes notice of as a Vulgar Error....

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1. In the same issue of "Phil. Trans." it was inquired "whether the Appearance of the Leggs and Arms of Men, related to stand out of the ground, to a great number, at a place five Miles from Cairo, on Good-Friday, do still continue? And how the Imposture is performed?" Neither inquiry was answered in subsequent issues.

Amongst other things worthy of note, the senselessness of the tradition of the Crocodiles moving his upper Jaw, is plain from the structure of the Bones..... Thus much is true, not only of this Creature, but of all others, which have a long Head, and a wide Rictus, that when they open their Mouths, they seem to move both Jaws; as both the Viper and the Lizard.

Edward Tyson in a book describing the dissection of a rattlesnake, T, 2/20/83, stated, "I have been told by Travellers, that some Crocodiles will leave a strong, but gratefull Smell behind them....." In April, 1698, T, Dr. Tyson reported that he had read a passage by "John Equemeling.....which I can't but take notice of: And if true, (as the Author assures us, that he has seen it often) 'tis an Instance of a Quadrupede.....that receives its Young into its Belly..... 'Tis a sort of Crocodile, which he calls a Cayman". He then quoted Equemeling:

They (the "little Whelps") run unto her, and play with her.....sporting themselves according to their own Custom. In this sort of Sport, they will oftentimes run in and out of their Mothers Belly, even as Rabbits into their Holes. This I have seen them do many times, as I have spyed them at play with their Dam, over the Water, upon the contrary Banks of some River; at which time I have often disturbed their Sport, by throwing a Stone that way, causing them on a sudden to creep into the Mother's Bowels, for fear of some eminent Danger.

DEER.

On June 20, 1666, B,

.....some affirmed, that the roots of the horns of deer falling off every year in April were eaten and loosened by worms; and that the itch of this gnawing caused the deer to rub and thrust their horns against the trees, which they met with. But others were of opinion, that the new and copious efflux of the humour of these deer thrust the effete horns out of their place.

On September 26, 1675, T, "that Ingenious Knight Sir George Makenzie" in a letter to James Gregory said:

Our Forresters alledge, that when Deer are wounded, they lie on a certain Herb, which grows plentifully in our Forrests, and that by its vertue the bleeding is stanchd, and the wound healed. I did take a quantity of it, and reduced it to a salve, with Wax and Butter. Its effect was that it healed too suddenly, so that I durst not adventure to use it in any deep wound..... At that time I did not know this Herb by any name; but now I find it to be Asphodelius Lancastriae verus of Johnston, or the Lancashire Asphodil.....

DITTANY.

On December 17, 1662, B,

Capt. Silas Taylor related, that the Virginians, when they would kill rattlesnakes, take the plant called ditany of Virginia, and having tied some of it between a cleft stick, hold it to the snake to smell; who presently coils herself up, keeping her head in the middle,

and turning it away from the plant as much and as long as she can: then after some moments of time, she opens herself on a sudden, and being stretched out in length is found quite dead. This relation he affirmed to have received from one Mr. Green, a very credible person.....

Captain Taylor reported again, T, 5/8/65,

The Wild Penny-royal or Ditany of Virginia, groweth streight up about one foot high..... The leaves.....bruised, they (unnamed) took.....and having tyed them in the cleft of a long stick, they held them to the Nose of the Rattle-Snake, who.....was killed with it, in less than half an hours time.....which was done Anno 1657, in the month of July, at which season, they repute these creatures to be in the greatest vigour for their poison.

DOLPHIN.

On October 22, 1671, T, John Ray, who "about the later end of April 1669, being at Westchester.....had the good fortune to meet with a young Porposs of a convenient size for Dissection", reported

.....largeness of the brain, and correspondence of it to that of man, argue this Creature to be of more than ordinary wit, and capacity, and make to seem less fabulous and improbable those Ancient stories, related.....by Pliny the Elder concerning a Dolphin enamoured of a Boy, whom he was wont to carry across a bay of the Sea, from Baiæ to Puteoli, to School, &c..... For the Porposs is, as I take it.....a lesser sort of Dolphin.....

Grew, p. 92, listed the "Head of a Dolphin", remarking:

In the skin, 'tis hard to find any passage of sound for Hearing. And Aristotle denies that the Dolphin hears. But Rondeletius truly saith, that he doth, and that the whole structure of the Internal Ear may be seen in the Skull.

DRAGON.

On June 24, 1663, B, "Col. Long.....was desired to add.....his observations.....of the winged serpent flying to a tree, the wings of which, he said, resembled those of a bat....." The November 6, 1665, T, review of Kircher's Mundus Subterraneus noted without comment that the book mentioned "Dragons". On October 26, 1672, B, it was inquired of Lord Henry Howard in Barbary "whether the dubb, a creature like a lizzard, about a cubit long, and four inches broad, drinks no water at all, but dies, if water be poured into his mouth", and Lord Henry replied, "No such beast as a dubb, only large lizzards.....but we know not whether they will die with water poured into their mouths".¹ And a review of

1. A dubb, or dab, dabb or dhabb, according to Webster is a "large spiny-tailed agamoid lizard."

a book about Swiss natural history by "Joh. Jacobo Wagnero, M.D. Tiguri", T, 7/10/83, stated:

Serpents there are, no doubt, but the Author takes pains to prove the existence of Dragons, with Feet, and without Feet, Wing'd, and without Wings, as big as a May-pole, but the Authorities are either old Histories, or Stories at the second hand, with few Circumstances.....

ECHENEIS.

Grew, pp. 104 ff., listed

The Shiphalter, Echeneis, Remora..... 'Tis about $\frac{3}{4}$ of a yard long..... Perhaps the same Fish, which Ligon saith, always swims along with the Shark, and frequently sticks to some part about his Head. At least, it is very probable, that this Fish is able to fasten himself to any great Fish, Boat, or Ship, with the help of the Coronet or Sucker on his Head..... Of the stupendous power which this Fish is supposed to have, there are many concur in the story; as that he is able to stop a Ship in its career under full Sail: and what not? and great pains is taken to assign the Cause; and to prove, That though the Moon be made of a Green Cheese, yet is not the only Nest of Maggots. Rondeletius alone, in ascribing it to his easily altering the position of the Helm, and so the motion of the Ship, coming near to good sense..... 'Tis plain, that the Tradition had a very early beginning, when little light Boats were the Ships which people us'd. To the side whereof, this Fish fastening her self, might easily make it swag (sic).....and so retard its Course. And the Story once begot upon a Boat, might still, like the Fish it self, stick to it, though turn'd to a Ship. Assigning as great a power to this Neptune in the Sea, as the Poets have done to Appollo the God of Life in the Heavens; who yet appears by the best accounts of him put together to have been at first no better than a Crafty Mountebank.

In a book about shellfish, T, 2/20/84, "P. Filippo Buonanni" of Rome, "Supposing the Concha Venerea to be the Remora of the Antients, he disputes the possibility of its being able to stop a ship".

EEL.

On December 23, 1663, B,

Dr. Croune affirmed, that he had seen several young eels alive in the belly of an old one, some of which were as big as a pin, others as slender as a fine thread, others yet unformed like a mucus. Mr. Boyle added, that he had met with the like relation in a German author.

A book of "miscellaneous curiosities" by a "Company of Ingenious Philosophers" in Germany, T, 2/20/71, spoke of "Eeles being Viviparous". On November 1, 1667, B,

Mr. Leewenhoeck's papers.....were read..... the particulars of which were.....that the blood of eels consists of long sharp pipes; whence he conceived to proceed the noxious qualities of eels blood in the eyes..... Sir Christopher Wren.....remarked also, that, as to the generation of eels, he had near twenty years before, upon the dissecting of eels found them to be viviparous, having several times taken the young ones out alive.....

"Robert Plott, oxford", in a book on natural history, T, 10/86, "speaking of Eels.....observes many which goe from one Pond to another in search of Provender,

and then shews by the concurrent suffrage of Natural Historians, that is no strang thing....." and in August, 1696, T, Huygens wrote to Leeuwenhoeck

.....concerning the Generation of Eels, It seems to me very strange, that their young ones are found by you in the Womb, without any Sign of Life; neither do you make any mention of Male kind of Fishes, which perhaps, may by Microscopes be found to be Living Seed, but we should be long to ask you every particular, there being still left innumerable Discoveries behind,

and Leeuwenhoeck wrote to the Society, "I cannot omit to tell you, that when I was Anatomizing of eels.....I never found a Male Eel nor Palinger, or Silver Eel, that I could call so....." On July 22, 1696, J,

.....a letter from Mr. Benjamin Allen.....mentioned some observations of his about the Generation of Eels which he finds to be oviparous, but they breeding in the month of February when they are Concealed in the Mud are rarely taken with the Rows in them.....

Allen's letter was printed in "Phil. Trans.", 8/97. He said he had examined some eels "taken at a Mill, in which Holes they breed.....and found one with Egg, another with Six young ones in the great Intestine..... It is certainly Viviparous..... The Parts distinguishing the Sex are discoverable". He added:

In Salt-water Eels, I have not found the like, though searcht for; because, I am of Opinion, that they do not breed, but are of the same with the Fresh-water ones, since such multitudes of Fresh-water Eels go down to Sea, and cannot return, yet are never taken at Sea, among the many brought hither.

In March, 1698, T, "Mr. Dale" submitted "An Account of a very Large Eel lately caught at Maldon," and noted:

Many there are, that with Aristotle, will have the Generation of Eels to be Spontaneous or Equivocal.....produced from Mud, or from a peculiar Sort of Dew, falling in May or June, upon the Blades of the Grass, whereof Turfs being cut.....the Sun's Heat will thence hatch them..... That the Generation of any Animal cannot be Equivocal.....but from Animal Parents, hath been so well.....confirmed.....that I think there is no room left in the least to doubt but that Eels have the same Original.....

Dr. Dale added that the controversy as to whether eels were hermaphroditic seemed to have been settled by "Mr. Lewenhoeck.....by the Help of his Glasses (which are very good ones)", whose dissections had led him to conclude that eels were hermaphroditic, possessing a uterus "provided with Masculine Seed". He said further that another question about eels - are they viviparous? - seemed to have been settled in the affirmative by "Walter Chartwynd, Esq.", who "in the Month of May" cut open females "from whence the Young Eels would issue forth alive".

ELEPHANT.

On October 22, 1666, T, an account of a voyage around the Indies by "M. de Bourges" gave these directions for elephant fanciers:

The way of keeping ones self harmless from a wild Elephant, when he runs directly upon one, is, to hold something to him; as a Hat, a Coat, a piece of Linnen, which he seizes on with his Trunk and playes with it, as if he were pleased with this apparent homage done to him; and so passes on. If he be in a rage.....then the only remedy is, to turn incessantly behind him to the left side, in regard to that naturally (saith this Author) he never turns himself that way, but to the right: and the time, there is to turn, because of the Beasts unweildiness, affords leisure enough to climbe up some high Tree, or to mount some steep ground: all which if it fail, by holding always his tail, and turning with him, the Animal will be tired, and give opportunity to escape.

On March 11, 1667, T, it was inquired whether in Suratte "the Rhinoceros have such an Antipathy against Elephants, as is commonly related," and in a book of travels in the East Indies by Philippus Baldaeus of Amsterdam, T, 2/19/72,

Our Author taketh notice.....that the Elephants, made to fight with one another before the G. Mogol, manage the combat with far greater agility and courage than one would imagine, and that they presently fall on, and desist according to the word given, embracing one another most lovingly with their truncks, as soon as they are commanded to end the combat.....

ELK.

On April 24, 1676, T, a book on natural history by members of the Royal Academy of France gave "Anatomical Descriptions" of several "Exotic Animals" including an elk,

.....of which they examine very sollicitously its Claws, together with the tradition of this animals curing itself of the Epilepsy (to which 'tis said to be very subject) by putting one of his feet into his Ear; whence the Claw of that foot is also much celebrated among the vulgar, as a specifick against that distemper. Of its Brain they take notice, that the glandula pinealis.....was of an extraordinary bigness..... Lions, Bears, and other bold.....Animals have that part.....very small..... The same is exceeding big in those that are very timorous, as the Elk; this Animal being esteemed to be so fearful, that it even dies of fear when it hath received the slightest wound, it having been observ'd, that it never survives when it seeth any of its own blood.....

FAIRY.

On June 8, 1698, J, the Society having inspected the "skinn" of an orang-outan, "Sr. Robert Southwell declared that in Ireland they called the supposed Faries by the name of Ouragan which seem'd to have some relation or similitude to the name of Ouran Outang....."

FAIRY RING.

A letter from Martin Lister, T, 9/26/75,
declared:

I have often been puzzled to give an account of those Phaenomena, which are commonly called Fairy-Circles; I have seen many of them, and those of two sorts, one sort bare, of seven or eight yards diameter, with green grass in the middle; the others like them, but of several bignesses, and encompassed with a circumference of grass, about the same breadth, much fresher and greener than that in the middle. But my worthy Friend Mr. Walker.....gave me full satisfaction from his own Experience. It was his chance one day, to walk out amongst some Mowing-grass.....after a great Storm of Thunder and Lightning..... He presently observed a round Circle, of about four or five yards diameter, the rim whereof was about a foot broad, newly burnt bare, as the colour and brittleness of the Grass-roots did plainly testifie. He knew not what to ascribe it unto but the Lightning. 1

On April 2, 1684, B,

Dr. Lister.....remarked, that fairy-circles were made by moles running around after one another under-ground in a circle, at the time of their coupling..... Mr. Hooke observed, that he had seen such circles on chalky hills, where he thought there was not ground enough for the moles to hide themselves.

A review of a book on natural history by Robert

1. The Smithsonian Institution does not know of the first, or "bare" type of fairy ring, nor to what cause to ascribe such a ring.

Plott, T, 10/86, said he thought "Fairy Walkes" owed their origin

.....not.....to the Field Conventicles of Demons and Witches nor to the subterraneous Courses of Moles and Ants, but rather to percussions made by Lightnings, which breaking out of the clouds in Concave Cones have made Circles on the ground conterminous to the Rims of those Cones, and according as the Cones.....have had a greater or less inclination to the Horizon.....have made Circles, or Quadrants, or Sextants &c. 1

FALCON.

On November 22, 1675, T, the author of The Gentleman's Recreation in four Parts declared

.....that the Eyrie of a Peregrine or Haggard-Falcon was never yet found in any Country, by any man, that he could ever hear or read of..... that she takes a large Liberty to her self, for her abode, either by Sea, or Land, and is so absolute in her power, that all flying-Fowl stoop under her Subjection; nay, that the Teircel-gentle, which is her natural Male, dares not sit by her, or come near her residence, but only in cawking time, and that is in the Spring; and then, for procreation sake, she will admit him to come near her with Submission, which he manifests with bowing his head at his approach, and by calling and cowering with his Wings, as the

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1. "I read somewhere of a shepherd who, when asked why he made, from within fairy rings, ritual observances to the moon to protect his flocks, replied: 'I'd be a damn' fool if I didn't!'" Dylan Thomas, Collected Poems, introductory note.

young ones do; in testimony how fearful he is of incurring her displeasure: That this generous Falcon flys to such a height, that being lost to the sight of Mortals, she seems to converse with heaven alone; yet such is her loyalty and obedience to her Master, that a word from his mouth shall make her stoop and condescend.....

FISH.

On March 25, 1661, B, "Mr. Boyle was requested to report the name of the place in Brasil, where that wood is, which attracts fishes; and of the fish, which turns to the wind, when suspended by a thread....." and on the following April 3, B, ".....an inquiry was again ordered to be made, concerning the fish mentioned by Schottus (a Jesuit mathematician), as turning to the wind, when suspended by a thread....." On May 6, 1667, T, it was inquired "whether there be in Hungary such a River.....whose water is so hot, and which is yet so full of Fish, that.....one would expect, that all the Fish drawn thence, would come out boyled?" On June 22, 1685, B, "Information" was given of a "monstrous fish with two hinder feet, taken upon the shore at Myrean: this will be seen and examined". One week later, B,

.....the monstrous fish.....was shewn; it is four feet seven inches $\frac{1}{2}$ long.....the head..... like a shark's..... It has two broad fins by the shoulders, and two lesser ones at the insertion of the tail, near the extremities of which fins grow out two very strong feet..... with joints and hollow hoofs..... It was dried and salted before we saw it, so that nothing remarkable within could be observed. Our seamen and fishermen affirm they have not seen any fish like it..... 1

On May 1, 1689, J,

Halley described the Polypus of St. Helena This fish called there a Cattfish, will walk on the dry Land, on its points as it were with Leggs, raising itself like a Great Long Legg'd Spider, and being pursued he makes to the water..... Sr. John Hoskins said, that the fish bredd in Stones, called Datoli, were to be found in the Island of Majorca.....

On April 9, 1690, J,

Sr. Robert Southwell said, that he had been informed that in the Rio des Amazonas there is a fish so tame, that the Indians will swim to him and stopp his nostrils with straw or the Like, so that in a Little time he swims to the Shoar, and becomes a prey to the Indians, tho he be a great fish of the Cetaceous Kind, and much bigger than a Sturgeon,

and on the following May 7, J, "Sr. John Hoskins said, that the fish said by Sr. Robert Southwell to be so tame.....seemed to be so, by reason they are

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1. Query: could this have been a seal? Or a coelocanth?

not yet accustomed to men, and know not their Danger".

FOSSIL.

The Royal Society devoted a great deal of attention to the problem of fossils; only a few of the discussions can be reproduced here. On October 22, 1671, T, Martin Lister wrote a letter stating

I am apt to think, there is no such matter, as Patrifying of Shells.....but that these Cockle-like stones ever were, as they are at present, Lapides sui generis, and never any part of an Animal..... That there is no such thing as shell in these resemblances of shells..... My reason is: That Quarries of different stone yeild us quite different sorts of species of shells, not only one from another.....but, I dare boldly say, from any thing in nature besides, that either the land, salt, or fresh water doth yeild us.....

Lister wrote again about "Rock-shells", claiming that he could "demonstrate" that they were merely "elegant representations of.....Bivalve-shells, which never ow'd their original to any Animal," in "Phil. Trans.", July 20, 1674. On November 20, 1676, T, "Mr. John Beaumont Junior" wrote in a letter,

.....as to that opinion which generally solves

those various Phaenomena of the several figur'd Stones.....by saying that they are parts of Plants and Animals, or whole ones, petrified; it seems not to be grounded on practical knowledge: Thus when we find several sorts of Shellfish in Mines, as there are some in the clay..... we must not flie to petrification, as though they had been brought there by the Sea, or otherwise, and so petrified; but we must take that to be (as it is truly) the natural place of their birth; some of them being raw-clay, others of the same texture with the Rock where they grow, and others of as absolute a shelly substance as any in the Sea; these being only different gradations of Nature, which can as well produce shells in Mines as in the Sea..... Nature can and does work the shapes of Plants and Animals without the help of a Vegetative soul..... To be satisfi'd of this, let them view the figurations in Snow..... The like may be said of Animals, which are often found depicted on Stones.....

Grew in his Catalogue, p. 253, remarked:

It hath been much disputed, and is not yet resolv'd, of many subterranean Bodies, which have the semblance of Animals, or Parts of them, Whether they were ever such, or no. And I am not ignorant of the Arguments offer'd on both hands. If I may speak my own sense a little, Why not? Is there any thing repugnant in the matter? Why not a petrify'd Shell, as well as wood?

On August 10, 1683, T, Beaumont again defended his lapides sui generis theory and attacked the counter-theory of extinct species by pointing out that fossils were found in England "as in foreign Countries," and "we cannot well imagine how so many species diffused through so many parts of the whole earth,

should all happen to be lost together". On August 22, 1685, T, "Mr. Edward Smyth" of Dublin reported on an experiment which actually proved nothing:

.....about 19 years ago, he stuck two Holly-Stakes (a wood which all agree will soonest petrifie in this Lough (Neagh)) in two severall places of the Lough.....and that part of the stake, which for so long a time has been washed by the water, remains there without any alteration, or the least advance towards petrification

On December 29, 1685, B,

Mr. Hooke read a.....discourse about shellstending to prove, that though it be true, that there is no animal known, resembling in all points the lineaments of those lately produced by himself; yet that is not a sufficient argument to evince, that there is not nor ever was any such animal in rerum natura.

In October, 1695, T, John Woodward in "An Essay toward a Natural History of the Earth" said fossil shells were "real Shells of once living Shell-Fish" and accounted for their presence far from existing seas by the "Universal Deluge" brought on "when Humane Nature had by the Fall of Adam suffered so great a Change, 'twas highly necessary the Earth should undergo a Change too....." And in February, 1700, T, Dr. Thomas Molyneux in a discourse on giants (q.v. infra) said some apparent bones were

"only natural petrifications, and Lapides sui generis accidentally so figured as to resemble this or that part of a man....."

FOX.

On February 25, 1663, B, "Mr. Grey.....who had frequented those parts", answering queries for Greenland, reported "the fox feeds upon the fowl, which he betrayeth, by feigning himself dead, and lying all along upon his back, and stretching out his tongue; at which when the silly fowl picketh, becomes his prey.....".

GIANT.

On November 6, 1665, T, the reviewer of Kircher's Mundus Subterraneus noted that it spoke of "the generation of Bony Substances under ground, by many esteemed to be the Bones of Gyants". A book on anatomy by "Isbrando de Diemberbroeck", T, 7/20/74, took "particular notice" of observations

.....made both by Schouten in his voyages, of having found about the Straights of Magellan, Men of ten and eleven Cubits high; and by Fazellus (unidentified).....of men found, some 17, some 18, some 20, and even 22 Cubits tall.....

On February 23, 1685, T. Thomas Molyneux in a letter "concerning a Prodigious Os Frontis in the Medicine School at Leyden" stated:

Altho' I have seen severall bones, of very large size, that were said to have been of Giants; yet I never was thoroughly satisfied, they really were so; imagining them only to have belonged to some other larger Creature, then a man, whose bones for the most part, excepting those of the head, do not much differ from those of other Animals. But this being an entire Os Frontis, compleat in every way, and differing in no respects from that of a Mans, but in its largeness; and since there's no Creature, especially of the larger sort that has this bone at all resembling ours; there's not the least Question to be made, but this formerly belonged to a Man, and that of a most extravagantly large size.....

Molyneux measured the bone, found it to be more than twice as large as "this same bone in severall ordinary Skulls," and declared that

.....according to the most moderate computation, supposing the height of a man to be no more than five foot 6 inches, he to whom this bone belonged, must have been at least more than 11 or 12 feet high, a prodigious height for a man, and such as some will scarce allow ever to have been, Sed ex Fronte Herculem &c..... 1

To those who might object that only the head of "he to whom this bone belonged" might have been out-sized, Molyneux said:

1. Grammar?

'Tis far more probable, and easier to allow, that a Body bore this head which was proportionable to it, then that it belonged to a Man or ordinary stature; who in this particular would certainly have been in one sence, the greatest Monster the World ever saw.

On April 1, 1696, J, "Doctor Hook produced a passage out of Platerus (unidentified).....wherein he mentions the Bones of a very Extraordinary Skeletonsupposed to have been of the Stature of about nineteen foot....."

GOAT.

On May 19, 1673, "Edward Brown, M.D., F.R.S." in a "Phil. Trans." account of his travels mentioned "a stony exrescence upon the Liver of wild Goats, highly commended in Germany for a signal remedy against malignant diseases and the Plague".

GOBLIN.

On November 19, 1666, T, an inquiry for miners was recorded: "Whether the Diggers do ever really meet with any subterraneous Daemons; and if they do, in what shape and manner they appear; what they portend; and what they do, &c.," and

Joseph Glanvill with the "help of an Ingenious friend I procured from some very experienc'd Mine-men" on September 21, 1668, T, replied: ".....concerning subterraneous Daemons, they have never seen any, but sometimes have heard knockings beyond their own Works, which, when follow'd by them, have afforded plenty of Ore." On November 16, 1668, T, "an Ingenious English Gentleman" reported his investigation of a Mexican mine: "I went in with my Candle lightned, but could not make the Indian follow me, being afraid of Spirits and Hobgoblins....." (He did not, apparently, see any spirits or hobgoblins himself.) On December 13, 1669, T, Dr. Edward Brown stated that he had been down a quicksilver mine and had heard no complaints of damps, and "much less could I hear any news of either noxious or innocent Apparitions, Virunculi, &c. such as some write, and many talk of in other Mines....." On May 22, 1676, T, "Dr. J. Beal" wrote that he had come across a "Neck of Veal" that shone in the dark, so "bright, and vivid" that he called the neighbours in to see it:

This I did partly to prevent, that they might not raise stories of Ghosts in my House; yet some were forward at it. If we had a mind

to act Pageantries, or to spread a story of Goblins, you see how easily it might have been done, by smearing ones hands and face all over with the tincture of light, which adhered so permanently.....

And on March 25, 1678, T, Dr. Christopher Merret in an account of Cornwall tin mines declared:

The Labourers tell stories of Sprights or small People, as they call them: and that when the Damp ariseth from the subterranean Vaults, they hear strange noises, horrid knockings, and fearful hammerings. These Damps render many lame, and kill others outright, without any visible hurt upon them.....

GOSSAMER.

On March 29, 1693, J, "Dr. Hook say'd, That he believed, that Gossmore is a substance, that is partly derived from the Foggy Air".

GRIFFIN.

Grew in his Catalogue, pp. 25 f., listed

A very great Horn of the Rock-Buck, or of the Ibexmas. In shape almost like a bended Cross-bow. By the string, $\frac{3}{4}$ of a yard long It was formerly tipp'd with silver, and kept in a Gentlemans House, and shew'd (to some special Friends) for the Claw of a Griffin.

HALCYON.

Sprat, p. 437, wrote that if England supported the work of the Royal Society, "the State of Christendom will soon obtain a new face; while this Halcyon Knowledge is breeding, all Tempests will cease....." On November 22, 1675, T, "Lucas Jacobson Debes M.A." in a book about the "Islands and Inhabitants of Ferroe" mentioned a water-fowl

.....called Imbrim; the Inhabitants taking it to be the Halcyon or Kingfisher; although it doth not agree with the description..... 'Tis never found on land; for its feet stand too much back, and are so weak, that it cannot go with them: besides, its wings are so little, that it can fly but little. It hath a hole under each of its wings, capable to hold an Egg, whereby the People suppose it hatches its eggs.....

HEDGEHOG.

The Society took notice of hedgehog fables only obliquely. On October 6, 1673, T, in a book by Thomas Bartholini there is mention of "the cure of the Dropsie by decoctions of the flesh of Hedgehoggs, frequently tryed with very good success," and it is said

.....that a live Hedge hog being shut up in a

great pipkin, and a flame made about it, the animal for a long time gave not any sign of pain; only it contracted it self into the shape of a very round ball, shooting out its bristles round about..... At length, all about him being red hot.....and the bristles falling offthe poor creature died with no other revenge than a slight grunting noise..... 1

On February 20, 1684, B, "Mr. Halley remarked, that he had found the blood of a sea-tortoise new killed as cold as water. Dr. Tyson observed the blood of an hedge-hog to be so."

HIPPOPOTAMUS.

Grew, pp. 14 f., listed a hippopotamus, and stated:

Rings made of his teeth, are believed to be very effectual against the Cramp..... His teeth, says Columna, are so hard, that being struck against Steel, produce sparks of fire. And thence concludes it probable, That this Animal, by striking his Teeth one against another, in the night time, might produce the like, and so seem, as it were, to vomit or breath out fire; a thing attributed to him by the Ancients. But the error of this Conjecture is double: First in his not considering, That the fire (could any be produced by striking Steel against these Teeth) would be struck not out of the Teeth, but out of the Steel. And next, In that, in truth, no fire can be

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1. It is not stated why this experiment was made.

produced by either striking of these Teeth one against another, or against Steel itself, as I have try'd.

HORSE.

On July 13, 1668, T, a letter from "a worthy person" stated

.....that horses of an Iron gray, or Dapple-gray, are frequently inclining to loose one or both Eyes, if back'd and hard ridden too soon. That in Man, and Beast (in Horses at least) the right eye is the weakest, and most frequently failing.

HORSEHAIR.

On May 1, 1672, B,

There was read another letter from Mr. Lister to John Brooke, Esq.....containing an observation about the generation of hairworms, and shewing, that such things, as are vulgarly thought animated hairs, are very insects, as ichneumons are within the bodies of caterpillars. The lord bishop of Chester affirmed, that he had found the like; which was confirmed by an observation of Mr. Boyle.

On the following May 20 Lister's letter, "rectifying a Vulgar Error", was printed in "Phil. Trans.";

It hath been credibly reported, that Horse hairs thrown into water will be animated; and yet I shall shew you by an unquestionable observation, that such things as are vulgarly thought

animated Hairs are very Insects, nourished within the bodies of other Insects..... Our observation is this. April 2. there was thrown up out of the ground of my Garden.....a certain cole-black.....Beetles which I dissected..... I was surprised to find in their swollen bellies of these Hair-wormes, in some three, in others but one only. These particulars were carefully noted: 1. That upon the incision they crawl'd forth of themselves. 2.....they lived..... many daies, and did seem to endeavour to escape by lifting up their heads out of the water..... 3. That they cannot be said to be amphibaena (sic), but do move forward only by the head..... 4. That the three.....were all of a dark hair-colour with whitish bellies, somewhat thicker than hoggs bristles..... One was much thickermuch lighter coloured; and by measure just five Inches and a half long: whereas all the rest did not exceed three inches three quarters.

On May 1, 1689, J,

Mr. Henshaw proposed, that the Experiment of putting Horse-hair & Lute-strings and the Like into water to see if they might not in this Summer weather acquire a Sort of Life, or motion at Least might be tryed. Mr. Waller said that he had seen one of those seemingly hairs that was alive, and Examining it with a Microscope he had found it to be a Sort of Worm, that had a Head, and the body was plainly covered with Scales.....

A week later, J, "Mr. Cole undertooke, to make the experiment of Enlivening a Horshair by laying it in water, affirming that He himself had Long since done it, when a Youth....." Mr. Cole's experiment must have failed, because there was no further mention of enlivening horsehairs in the seventeenth century records of the Society.

HUMMING BIRD.

In May, 1693, T, Dr. Grew "communicated" a description of "the American Tomineius, or Humming Bird":

He is call'd the Hum-bird or Humming Bird, because some say he makes a noise like a Spinning Wheel when he flies, which I think rather an Imagination than real; for I have been many times very near them, both when they hover'd and when they did fly, and I never heard any Noise; besides, their Body and Wings are too small to strike Air enough to make any Noise. But of this I shall not be positive, because some Authors are opposite to me.....

In June of the same year, T, Grew wrote:

.....it is believed he feeds on some Juice he sucks off, or out of Flowers. It was believed for a long while, that the Bird of Paradise had no Legs. Whether may not this Bird rather feed on small Insects. whereon many Birds feed, some whereof lie in the bottom of most Flowers, and for which, this Bird hath a Bill? Whereas a Bee that sucks hath a Siphon or hollow Probe. In short, the Bird should be open'd: And so it will appear, either that he hath Entrails fitted only for Liquids: or the same sort of Stomachs and Guts as other Birds, containing the same sort of solid Food.

And in December, 1693, T, John Clayton in a letter declared that the humming bird "feeds upon the Honey of Flowers: I have been told by some Persons, that they have kept of these Humming Birds alive,

and fed them with Water and Sugar; they are much the smallest of all Birds....."

HYBRID.

On March 9, 1664, B,

Sir Robert Moray related, that he had heard from Dr. Hinton of a copulation of a male rabbit and a female cat, which produced monsters, whose foreparts were like a cat, and the hinder parts like a rabbit; and that those monsters had reproduced more complicated monsters: of all which he hoped to procure a fuller account in writing.....

On April 24, 1676, T, a review of a book by members of the Royal Academy of France stated:

They give us the Anatomical Descriptions themselves of 13 species of Exotic Animals; of which (is).....a Chat Pard (supposed to be engendred by a Leopard and a Sow-catt,)..... They chiefly note the defect of Spermatick vessels, and of other parts absolutely necessary to generation.....where they take occasion to observe, that the Sterility, which is ordinary in some of those Animals that are born of two different species, must have in this subject a very particular cause..... Aristotle.....imputes this defect only to the Temperament of those Animals, whose parts have contracted a hardness that renders them incapable to contribute to a new mixture: So that, if it be true, that most of the Animals, which are born of the mixture of two kinds, are notwithstanding fruitful, they are inclined to believe, that the conformation of this Chat-Pard was peculiar and accidental.....

On June 3, 1680, B, Wren and Aubrey "mentioned a production which they had seen, from a male cat and a female rabbit". On June 10, 1683, T, "Wilhelm ten Ryne M.D." in a book on unusual creatures opined that "the Monsters of Egypt and other parts of Africa are mostly produc'd by a promiscuous venery of Beasts of various Species brought together to rivers by a common thirst....." On July 10, 1683, T, the same "Joh. Jacobo Wagnero, M.D. Tiguri", who in his book on Swiss natural history had spoken so warmly of dragons, wrote of "Moschelaphi generated of a Stag and a Cow, and Hippotauri generated of a Bull and a Mare," and in September, 1699, T, Dr. Edward Tyson in a treatise "proves there were such creatures as the Ancients called Pygmies, Cynocephali, &c. And that these were all either Apes or Monkies, and not Men....."

INCUBUS.

In April, 1700, T, an account of a book, ".....An Incubo Terrum rubiginosum? Monsp.....", stated:

The Incubus, or Night-mare.....is not a meer Dream or Fancy, but a real indisposition There is no room to doubt these appear-

ances in sleep.....of being bestrid by a Hag,
 proceed from a painful and difficult respira-
 tion.....a nocturnal Asthma..... Melancholy
 and timorous persons are frequently infested
 with this Malady..... As for the Authors
 Method of Cure.....general Remedies to prepare
 the Body.....Aperitive and Altering Medicines
assiduous use of Absorbents, as Crabs eyes,
 Coral.....Rust of Iron, which does not only
 take off the edge of the Acid, but by its rough
 and sharp parts breaks the Viscosity of the
 Animal Liquors.....

LAPLAND WITCHES.

On December 24, 1662, B, "Mr. Hoskyns com-
 municated his Inquiries to be sent to Iceland",
 among them the query, "Whether it be true, that
 they sell winds, or converse with spirits, or often
 see them?" On April 27, 1674, T, "Johannis Schef-
 feri" in a book called Lapponia said the Lapps were
 "exceedingly superstitious, timorous and un-warlike;
 whence the Author takes occasion to undeceive the
 World, that had hitherto been perswaded, as if that
 great Warrior, King Gustavus Adolphus, had done his
 great Atchievements by Laplanders, and their Magical
 Arts", called the Lapps covetous, deceitful, sloth-
 ful and proud, though faithful to their wives, good
 to the poor and "hospitable enough to Strangers",
 and described their "Magical Drum",

.....on which are painted various Pictures, not only of their ancient Gods, and of Christ, and his Apostles, but also of the Sun and Stars, and various Beasts, Serpents, Lakes and Rivers..... They have all of them an Index and an Hammer. The Index is a bundle of brass or iron-Rings, of which the biggest hath a hole in the middle, the smaller ones being appendant to it..... The Hammer or Drumstick is made of the Horn of a Rheen-Deer, wherewith they beat the Drum, to make the aforesaid Rings, laid on the top of the Drum, move and dance about the Images pictur'd thereon, and at last to shew what they have a mind to be resolved of. And the use they put this Drum to.....is, that by beating it they may explore chiefly these three sorts of things; 1. What Sacrifices they shall best please their Gods with? 2. What success they shall have in their business and undertaking? 3. What is done in places remote from them? Concerning all which, What Ceremonies and postures they use in beating this Drum.....would be too long and too tedious to transcribe..... Besides this Drum, they make use of a Magical Cord, that hath three knots in it, of which when they untye one, they raise a tolerable Wind; when the second, a much stronger wind; when the third, a great Storm. They serve themselves also of Magical Arrows, by which they are believed to cause diseases, pain, and other mischief, even to those that are distant from them. And these Arts they not only exercise against strangers, but also against one another; concerning which, here is related an odd example of one, that excelling in Magic, could not be overcome by his Adversary, how skillful soever in the same Art, till he, being found asleep under a Rock, was kill'd by his Enemies craft, breaking that Rock and throwing it upon him.....

On December 7, 1681, B, "Mr. Heisig, a Swedish gentleman.....gave the Society a Lapland magical drum", and one week later, B, it was stated that

the Society had received the drum and the "beater or drum-hammer" and also

.....a piece of brass with rings hanging by chains, called the frog, which the Laplanders lay on their drum-head, when they beat it, and by knocking with their drum-stick.....are said to make it dance.....till at last it fixes upon some figure made upon it, and will not be thence removed by any farther taboring: which having found, they pretend, that that mark, on which the frog rests, gives them sufficient information.....

On June 15, 1685, B,

Dr. Willoughby.....gave a conjecture how the trade of selling winds was performed in Lapland, &c. viz. by a constant diligent observation, they foreknow the most notable changes thereof, which are more regular and stated in those colder countries, than with us: and hence it is, that the seller will determine his wind to such a day, but not any particular one which the chapman requires.

In December, 1685, T, a letter from William Nicolson said

.....For that the Danes were antiently, as well as some of the Laplanders ate present, gross Idolaters and Sorcerers, is beyond Controversy 'Twas not very difficult to imagine that they might for some time practice their Hocus tricks here in the North..... This conceit was the more heightened, by reflecting upon the natural superstition of our Borderers at this day; who are much better acquainted with, and do more firmly believe, their old Legendary stories of Fayries and Witches, then the Articles

of their Creed..... They are not utter Strangers to the Black Arts of their forefathers.....

LEECH.

In December, 1687, T, "Mr. John Weichard Valvasor F.R.S." wrote a letter about Lake Zirknitz in Carniola stating that in this lake

.....is an incredible Number of Horseleeches, which according to the vulgar Opinion, understand certain Words; for that upon repeating them, they will come in great Parties towards him that repeats them, whereas if he be silent, very few of them will touch him.....

LIFE ON OTHER WORLDS.

On June 5, 1665, T, "M. Auzout", after considering Mr. Hooke's "new instrument for grinding optick glasses", declared that "we are yet very far from seeing Animals &c. in the Moon, as Monsieur DesCartes gave hope, and Mr. Hook despairs not of" Mr. Hooke replied in the same issue of "Phil. Trans.":

I cannot but return him my wishes, that he would consider the difference between seeing a thing through the Gross and Vaporous Air near the Earth, and through the Air over our heads; Which, if he observe the Moon in the Horizon, and neer the Zenith with a Telescope, he will

experimentally find; and, having done so, he will perhaps not be so dissident in this matter.

On December 4, 1665, T, M. Auzout allowed himself to speculate on what the "supposed Inhabitants of the Moon might discover in our Earth" if they observed us, decided that they could notice our changes of season, our rivers and our cutting down of whole forests and draining of "marrishes.....of an extent large enough to cause a notable alteration" and concluded, "but yet, I know no man, who hath observed such things in the Moon....." In September, 1699, T, Christian Huygens in a letter to his brother Constantine advanced it as a "probable" conjecture that other planets were "likewise Adorned with the more admirable Productions and Fabricks of Plants, and Animals which more evidently manifest the Wisdom and Design of the Divine Architect", but concerning the moon, he was of opinion that since it had no seas or rivers - "those Spots which others have supposed Seas, are only great Plains of a darker Colour " - it could have no water, atmosphere or air, and therefore no "Animals, no, nor Plants". "And yet at last.....'tis not improbable but that it may have Plants and Animals too, but they must have another sort of Nourishment....."

LION.

On October 21, 1667, T, a report of a dissection of a lion by "the Parisian Philosophers" declared that the eyes were "very clear and bright, even after death," and

.....the Brain was but two inches big, of any dimension..... By comparing the little quantity of the Lyons Brain with the plenty of that of a Calf, it was Judged, that the having but little Brain is rather a mark and a cause of a fierce and cruel temper, than want of wit.... 1

On October 26, 1672, B, it was inquired of Lord Henry Howard in Barbary "whether it be true, that the lions about Pietro Rossa are so tame as to go into the streets and gather bones; and at Agla the lions so cowardly, that they flie at the voice of a child?" and Lord Henry replied "I can give no account of lions in these places in particular; but generally, the lions of Barbary are very great and fierce, coming often into the streets of towns seeking for prey, which they never do upon any dead body" M. de Thevenot in his account of "divers Voyages Curieux", T, 12/16/72, wrote that he met with "Tigers very fierce" and "Lyons very gentle" in

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1. For another Society consideration of the relation of brain size to ferocity, cf. the note on ELK.

South America; on November 20, 1676, T, M. Tavernier in his "Observations concerning some of the most considerable parts of Asia" reported that "Porcupins kill Lions, by darting into their body their quills....." and on February 19, 1690, J,

Sr. Robert Southwell said, that in Angola there are a Sort of animalls, near as big as ferrets, which will Destroy by their numbers, and eat up any animall whatsoever even a Lyon upon which they will set with such fury, that nothing can resist them.

LONGEVITY.

On December 17, 1666, T, it was inquired whether in Turkey people lived "many of them, to a hundred and twenty years, in good health?" On October 19, 1668, T, Richard Stafford in a letter from the Bermudas reported that some of the people there "do live to an hundred years and something upwards..... And when they dye, 'tis age and weakness, that is the cause, and not any disease....." On March 25, 1670, T, Dr. J. Beale among some "Ingenious Reflexions relating to Medical Springs" hazarded the opinion that "the Air in Bermudas, and near Florida in Virginia, preserves tham that are addicted to a simple and Natural Diet, without sickness; and frequently to an hundred years....." On April

18, 1672, B, a query for Hudson's Bay concerning longevity of people there was answered: "They live many times to a great age, to an hundred and twenty years." On November 15, 1682, B,

Mr. Evelyn remarked, that Sir Walter Raleigh had in the account of his voyage to Virginia related, that he there met with a king of that country, who was 300 years old, and who lived for a considerable time longer..... He farther thought, that the king's name was Pouhatan..... Mr. Houghton mentioned, that he had been credibly informed, that the people of Ireland commonly lived to the age of 150 years.

On June 20, 1684, T, Martin Lister in a letter stated

William Garthrop and William Baxter of Carlton inform me, that.....they saw and spoke with in the Assize-Hall, two Men, Father and Son.....the Father told them.....that his Son was above 100; and that he wanted not half a year of 140. He told them further that he could and did make Fish-hooks as small as would take a Trout with a single hair..... The Food of all this mountanous Country is exceeding course..... I am confident many scores of persons might be found of the age of 100 years among these Northern Mountains, but 'tis troublesome to verifie, and you must not take these Reports as Authentick and exact; but yet credible enough, to make the matter worth the Examination.

On February 27, 1695, J, "Mr. Creed related that Francis Harris the Alms-man.....said to be of a very great Age, as 6, or 7 Score.....was found upon Exami-

nation of the Register, to be no older than 81.....,"

In August, 1696, T, Tancred Robinson in a letter stated that he had long doubted stories about the great age of one Henry Jenkins,

.....till one day being in my Sisters Kitchin, Henry Jenkins coming in to beg an Alms.....I told him he was an Old Man, who must suddenly expect to give and Account to God.....and I desired him to tell me very truly how Old he was, and he paused a little, and then said, that to the best of his Remembrance he was about One hundred sixty two or three; and I asked him what Kings he remembred, he said Henry VIII; I asked him what Publick thing he could longest remember, he said Flowden-field..... I asked him how old he might be then, he saidbetween Ten and Twelve..... This Henry Jenkins departed this Life the Eighth day of December, 1670.....the Battle of Flowden-field was Fought upon the Ninth day of September..... 1513. Henry Jenkins.....lived one hundred sixty and nine years.....and was the oldest Man born upon the Ruines of this Postdiluvian World.....

MANATEE.

In Kircher's China Illustrata, T, 6/3/67, there was mention of "Sea-Cows, going often ashore, and fighting with the Land-Cows". And Grew, pp. 87 f, listed a "pair of the Manatee-Stone's" and stated:

A certain Indian King kept and fed one of them (a manatee) with Bread six and twenty years

in a Lake near his House, which grew tame, beyond all that the Antients have written of Dolphins: He would sometimes carry ten people on his Back, with ease, across the Lake.

MANCHINEEL.

On March 16, 1668, T, it was inquired of the "Ant-Iles, or Caribbe Islands,"

.....Whether the fruit Mancenille of the Mancenillier-Tree, though admirably fair and fragrant, yet is fatal to the Eater, and falling into the Water, kills the Fishes that eat thereof, except Crabs.....and whether the shadow of this Tree be so noxious, that the bodies of Men reposing under it, will swell strangely?

On June 15, 1668, T, Dr. Stubbes reported, presumably from Jamaica:

About the Manchinel-Tree, I shall only say, it is a wood of an excellent grain..... The Spaniards turn it into beds, and the English usually flour their rooms with it in Jamaica; yet it is as malignant, I am told, as 'tis described.....

On November 16, 1668, T, "Mr. Norwood the younger, an Eye-witness," answered an inquiry for Jamaica: "the Manchinel-Apple is one of the beautifullest fruits to the Eye.....and of the pleasantest taste (being thence call'd by many the Eve-Apple) but if eaten, certain death. The wood of it yet green,

if rubb'd against the hand, will fetch off the skin
 " On March 26, 1696, J, Dr, Sloan "say'd
 That it was generally Esteemed unwholesome to re-
 pose under the shade of some sort of Trees and par-
 ticularly of the Mansanill Tree".

MANDRAKE.

Grew, p. 227, describing the "Root Ninzin,
 corruptly called Gensing", said it was "Not stringy,
 as in Piso, but divided, as often the Mandrakes and
 some other Roots, into two Legs".

MERMAID.

On July 8, 1669, B,

Mr. Hooke acquainted the society, that
 looking over some of the things in their reposi-
 tory, he had met with such a hand as Mons. Le
 Febvre once produced before the society, men-
 tioning that it was given him for the hand of
 a mermaid; but that this hand was part of a
 sea-leopard, and altogether like that of Mons.
 Le Febvre.....

Grew, p. 81, listed two mer-items:

The Rib of a Triton or Mareman..... The
 Fish to which it belonged, was taken near Brasile
it is called Ypupiapra. A Bone said to be
 taken out of a Maremaid's Head. It is in big-

ness and shape not much unlike that called Lapis Manati; but the knobs and hollows thereof are somewhat different.

METAMORPHOSIS.

On March 11, 1667, T, inquiries were directed "for Guaiana and Brasil" asking

.....whether it be true, that the Locust of Brasil, call'd Caayara, changeth in the Spring-time of that Countrey into a Plant, and withers away, like a Plant; and whether in the same Countrey, that kind of Eruca, call'd by the Portugals Lagartas des Verias, turns into a Bird, admirable for Colour and swift flying; the change thereof being made so leasurely, that one may for a while see half of the Insect. and the other half of the Bird, which the Natives call Guanumbi, the Portugals Pegafrel.....

and on the same day, T, it was inquired whether in Suratte "there be a Plant, call'd by the Inhabitants Catopa, whence fall little Leaves, which are turned into Butter-flies?" Kircher's book China Illustrata, reviewed June 3, 1667, T, spoke of "Fishes, in Summer flying out of the Sea, seeking their food, like Birds, and in Autumn returning to the Sea....." On March 25, 1673, T, Francisco Redi in a book of experiments said he could not believe

.....that in the Seas of China there are certain scaly Fishes of a Saffron colour, which in winter

live in the water, but in Spring cast their scales, get feathers and wings, and so fly ashore into the woods, and there live all summer and autumn, but then return to their former shape and betake themselves again to the habitation of the Sea.

Grew wrote, pp. 175 f.:

Moufet affirmeth, That in the Transmutation of the (silk) Worme into a Fly, the Head of the Worme makes the Tail of the Fly; and the Tail of the Worme the Head of the Fly. But Sigr. Malpighius makes no mention thereof; neither is it any way likely to be so.

And in his description of the Museum's humming bird, pp. 62 f., Grew stated:

Piso relates.....That there are (in Brazil)a sort both of Caterpillars and of Butterflies, which are transform'd into this Bird; and that in the time of Transformation, there is plainly to be seen half a Caterpillar or half a Butterfly, and half a Bird, both together. Yet the same Author saith, That this Bird buildeth her nest of Cotton-Wooll, and layeth Eggs. That a Caterpillar should produce a Bird; and a Butterfly too, the like; and yet this Bird lay Eggs to produce its own kind, are three greater wonders than any thing that hath been said of the Barnacle. But we will rather suppose these men were themselves deceived, than that they designed to deceive others

MOLE.

On February 22, 1675, T, among various inquiries "recommended to Observation and Tryal" was this one:

Whether Experience do verifie.....a way of freeing the ground from Moles, viz. by digging a deep hole, and putting into it a pretty deep glazed earthen pot, broad below and narrow a top, throwing a dead Crabfish (sic) into it; whereupon the Mole, upon the smell of the stinking fish, will creep into it, and falling into the pot, cannot get out again?

MONSTER.

On June 20, 1676, T. "Mr. Thomas Glover, an ingenious Chirurgion that hath lived some years in that Country," gave an account of Virginia in which he included this story about a "very strange Fish or rather a Monster, which I happened to see in Rapahan-Nock River":

As I was coming down the forementioned River in a Sloop bound for the Bay, it happened to prove calm..... I took a small book out of my pocket and sate down at the stern of the vessel to read; but I had not read long before I heard a great rushing and flashing of the water, which caused me suddenly to look up, and about half a stones cast from me appeared a most prodigious Creature, much resembling a man, only somewhat larger, standing right up in the water with his head, neck, shoulders, and waste, to the cubits of his arms, above water; his skin was tawny, much like that of an Indian; the figure of his head was pyramidal, and slick, without hair; his eyes large and black, and so were his eyebrows; his mouth very wide, with a broad, black streak on the upper lip, which turned upwards at each end like mustachoes; his countenance was grim and terrible; his neck, arms, shoulders, breast and wast, were like unto the neck, arms, shoulders, breast and wast of a man; his hands, if he had any, were

under water; he seemed to stand with his eyes fixed on me for some time, and afterwards dived down, and a little after riseth at somewhat a farther distance, and turned his head towards me again, and then immediately falleth a little under water, and swimmeth away so near the top of the water, that I could discern him throw out his arms, and gather them in as a man doth when he swimmeth. At last he shoots with his head downwards, by which means he cast his tayl above the water, which exactly resembled the tayl of a fish with a broad fane at the end of it..... 1

MORSE.

On February 25, 1663, B, Mr. Grey, "who had frequented those parts", answered an inquiry to Greenland; "there is the sea-morse, having a lion's look, and scales", and Grew in his Catalogue, pp. 88 f., listed the "Skull of the Morse: so called by the Muscovites; by the Danes, Rosmarus..... when they sleep, one of them, as among Cranes, is set to watch".

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1. Query: could this "prodigious Creature" have been a Manatee? In the Ortellius atlas, Theatrum Orbis Terrarum, printed in 1599, there is pictured a greenish-bluish, pointed-headed, fish-like creature standing up in the water, near Iceland, described as the "Stankul, in German Springhual", which "has been seen to stand erect on its tail the whole day long. Its name comes from its habit of jumping. It is astonishingly dangerous to ships, and is very fond of human flesh".

MOUSE.

On December 24, 1662, B, it was inquired of Iceland, "what is said there concerning raining mice?", and on August "6 & 7", 1689, J, "Mr. Henshaw said, that in Norway the Mice are thought to fall like rain out of the skye....." ¹

MUSIC.

On May 24, 1675, T, "J.B. Gent." in a book on husbandry noted:

Since the most furious of Mankind, and the fiercest of other Animals may be tam'd by Musicand since the Crocodile, Serpents, Fishes and Sea-monsters may be made fond and serviceable to Mankind.....we may thence hope and presume, that the Cicuration (taming) of all Animals.....may hereafter come into more esteem..... No Treat can be more safe, innocent, and effectual for an unreclaim'd people, to reduce them to apply their ears to the best documents, than Music; Sometimes to make their Wilderness accho with the Trumpet, Coronet, and loudest Musick; Sometimes to cheer up all with the merry Flagellate, Flute, Fife and Pipe: And when the game is ended, to sweeten all with the Lute, Harps, and Violins.....

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1. Hurricanes sometimes sweep little creatures into the air, to descend in rain, but more often their sudden appearance during a rain is caused by the fact that the water has driven them from their holes.

In August, 1678, T, "Mr. Matthew Milford" in an essay remarked that a certain man who spoke in "Eights, some Fifths, some Thirds," produced conversation of a "most pleasing sound" and was "the most affable, pleasant and the best natured in the Company," and concluded:

From the difference of Musick, in Speech we may also conjecture that of Tempers. We know, the Dorick Mood sounds Gravity and Sobriety; the Lydian, Buxomness and Freedom; the Aeolique, sweet Stilness.....the Phrygian, Jollity and Youthful Levity; the Ionique is a stiller of storms.....and why may we not reasonably suppose, that those whose speech naturally runs into the Notes peculiar to any of these Moods, are likewise in Nature hereunto congenerous.....as he that speaks in Gamut, to be manly, C Fa Ut.....to be of ordinary CapacityG Sol Re Ut, to be peevish and effeminateSharps, an effeminate; Flats, a manly or melancholick sadness.....Semibreifs.....a Temper dull, and flegmatick; Minums, grave; and serious Crochets, a prompt Witt; Quavers, vehemency of Passion, and Scolds use them. Semi-breif-Rest may denote one either stupid, or fuller of thoughts than he can utter; Minum-Rest, one that deliberates; Crocher-Rest, one in a Passion; So that from the Natural use of Mood, Note, and Time, we may collect Dispositions.

In August, 1698, T, Dr. John Wallis in a letter said, "It is manifest that Birds and Beasts are affected with Musical Notes as well as Men," but he wondered why "these great effects which are reported of Musick in Former Times, (Orpheus, Amphion &c,) are

not as well found to follow upon the Musick of
Later ages," and continued:

I take it for granted, That much of those Reports is highly Hyperbolical, and next door to Fabulous; according to the Humour of those Ages, termed by Historians, Tempus Mythicum, (the Fabulous Age), for whatever may be thought of Men, Beasts and Birds, no Man can think that the Trees and Stones did Dance after their Pipe. And even in more modest Times, the Poetical Stories of Olympus, Atlas, and other Mountains, reaching up to Heaven, are much beyond what is now found in those Parts where they are said to have been; and many Mountains now well known (as the Alps, the Apennines, the Pike of Teneriffe) are much higher than their Atlas or Olympus. And their Famed Tyber is but a Ditch compared with our Thames. And like Abatements we must allow to the Hyperbolical Elogies of their Musick.....

OSPREY.

Grew, p. 56, listed

.....the Head of the Sea-Eagle or Osprey.....
The Claws of the same Bird..... The Eagle
breeds abundantly on the Mountains Taurus and
Caucasus.....is said to build yearly on the
Rocks of Snowdon..... In the Year 1668, on
the Peke in Darbyshire, was found an Eagles
Nest, flat or level, and about two Ells square;
together with a young one in it.....

OSTRICH.

On December 16, 1672, T, in a review of
a travel book of Thevenot's, it was stated:

.....he relateth a remarkable thing, which he saith he hath seen, viz. That when that Bird (ostrich) is hatching her Eggs.....she breaks four of them and carries them to the four corners.....which Eggs thus broken coming to corrupt, there is in a little time bred out of them.....worms, with which the young ones, when hatched, are fed..... 1

OYSTER.

On December 3, 1662, B,

Dr. Merret suggested, that it should be inquired, whether oysters do not differ in sex, it being observed, that some of them, supposed to be females, are all white, and cast forth a kind of spittel; and that others, esteemed to be males, have a black spot and do not spit.

On February 20, 1684, T, the reviewer of a book on shellfish by "P. Filippo Buonanni" of Rome stated that this author, considering the problem of origin of oysters, a problem "much controverted among Naturalists",

.....enumerates and exmins the several opinions concerning it, viz. That they propagate their own Species by their own Nature as other perfect Animals.....that they arise from putrefaction, as Insects have been supposed to do;

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1. Ostriches might break their own eggs because of clumsiness, but it is not now believed that they would do so deliberately, even if they could manage to get them into the "corners" of a round nest.

and some few opinions more subordinate.....and not at all acquiescing in, neither confuting, the reasoning and experiments of Steno, Redi, or Lyster, he imbraces the old and antiquated opinion of their being equivocally produced out of putrefaction, for which he brings little proof besides the well known reasons, and the Authority of Aristotle.....

PEARL.

On March 25, 1674, T, "the Learned Christophorus Sandius" in a letter from "Hamborough" stated that he had been informed that pearls were produced by "Pearl-shells" like "Muscles" only larger, and that when this "shell" cast out its eggs,

.....sometimes it happens, that one or two of those Eggs stick fast to the sides of the matrix, and are not voided with the rest. These are fed by the Oister against her will, and they do grow, according to the length of time, into pearls of different bignesses.....

On December 19, 1678, B,

Mr. Bemde related, that many pearls were found in a river, which runs into the Danube near Passau: that these pearls were very good; and that they were found in the very mud of that river, and not in the shell of any fish: and thence it was supposed, that they were cast by some fish out of their stomachs since it has been observed by Dr. King, that the pearl in oysters is generated in the stomach of that fish.

On February 20, 1684, T, Buonanni in his book on

shellfish

.....enquires about the generation of Pearls,
and in what kinds of Shellfish they are found,
whether the matter they are formed of be the
dew; whether they grow from the Shell, or
are produced in the body of the Fish,

but he did not answer his own questions. On April
1, 1685, B, "Mr. Henshaw remarked, that the pearl
consisted of a multiplicity of coats like a bezoar;
and that it might be bred in the stomach", and on
June 9, 1692, J, "Mr. Henshaw said he supposed
Pearls breed like Bezoars in the Stomach of the
Oysters and that they are Coated like Bezoars, and
thence are called Uniones, from the resemblance to
the Coates of Unions". Sir Philberto Vernatti,
answering queries to Batavia, S, p. 168, wrote:
"This Pearl-fishing is dangerous, being the Divers
commonly make their Will, and take Leave of their
Friends, before they tread the Stone to go down",
and in October, 1693, T, Samuel Dale in a book on
pharmacology gave it as his belief that pearls were
"only the Diseases of Bivalve Shell-fish.....not
.....endued with those excellent Vertues ascribed
to them by most Authors....."

PELICAN.

Grew, pp. 69 f., listed

The Peleucane..... The Crop is extended to the very end of his Bill. 'Tis probable, that the use of this Bag is not only for the reception, but also the maceration of his Meat 'Tis also probable, that the Meat being herein warm'd, and made a little tenderer, the Female doth disgorge part of it; wherewith to feed her Young. And might occasion the Fiction, of this Birds feeding her Young, with her own Blood.

PETRIFACTION.

On December 24, 1662, B, an inquiry was sent to Iceland concerning a "lake always smoaking, though cold; into which if wood be thrown, it turns it stone.....but what is in the mud, is like ironbut in the fire it burns". On May 13, 1663, B,

.....it was ordered, that the lord viscount Massareene be desired to inform the society concerning the transmutation of holly into iron, as far as it is stuck into the ground under the water of a lough, and into stone as far as it stands in that water.....

Two weeks later, B,

Dr. Glisson thought, that the petrification of wood was occasioned by the passing of stony juices into the pores of wood throughout, and by the filling them all up, and so coagulating there, without changing anything of the figure of the wood.....

On June 17, 1663, B,

.....the lord viscount Massareene signified to the society that it was any wood, which in a lough of his in the north of Ireland turned into stone; and that one part was often wood, and the other stone; but he knew nothing of the story of the part turned into iron.....

Kircher's Mundus Subterraneus, reviewed November 6, 1665, T, told "a Story of a whole Village in Africa turned into Stone, with all the People thereof," and on October 22, 1666, an anonymous contributor to "Phil. Trans." remarked that "what has been related.....concerning the stupendious Petrifications of whole Companies of Men, and Troops of Cattle," was "perhaps not well enough attested". On April 20, 1684, T, "the learned and ingenious Will Molyneux" wrote in a letter:

.....I am certainly informed, that a Gentleman
.....a little before the Rebellion cut down
some Timber..... His Timber lay on the ground
.....all the miserable time of the War; till at
last.....the Gentleman.....found.....the Holly
petrified, tho the Water of the Lough had never
reached it.....

On January 4, 1699, J, Hooke "read a Discourse of his own about Petrefactions" in which he attacked the theories

.....of those who ascribe them to miraculous and Supernatural Effects.....wrought by the prayers of Saints or by the Charms.....effected by Witches or Evil Spirits.....of those who ascribe them to a peculiar formation by mineral vegetation, and 3dly of those who ascribe them to Noahs flood.....To which were added many arguments to confirm his own hypothesis by preceding Earthquakes and their undoubted powers to Effect such Change and Disposition.....

PIGEON.

John Clayton wrote from Virginia:

There's the strangest Story of a vast number of.....Pidgeons that came in a Flock a few Years before I came thither; they say theywere so prodigious in number as to darken the Sky for several Hours - and brake massie Bows where they light.....nothing of the like ever happen'd since..... I am not fond of such Stories..... 1

PIKE.

On November 12, 1662, B, "Dr. Charlton promised to provide a pike against the meeting for

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1. In the early nineteenth century Audubon reported seeing passenger pigeons "flying in flocks seven or eight miles long, more than a mile wide, and so compact that the sun was hidden from view as they passed. When one of these flocks.....settled on a forest.....trees broke under their weight." Stimpson, A Book about a Thousand Things, p. 501.

dinner, in order to shew every second tooth moveable
" On March 16, 1668. T, it was requested that
 someone in the "Ant-Iles" send over a "Land-pike,
 which is said to be like the Water-pike, but that
 instead of Fins it hath four feet, on which it
 crawls....." On November 22, 1675, T, a book on
 sports by an unnamed author called the pike the
 "Tyrant of Fresh-waters" and said that he

.....fought with an otter, for a Carp taken;
 bit a Mule by the lip, as he was drinking; bit
 a Maid by the foot, as she was washing; and
 frequently devours his own kind.....yet will do
 no injury to the Tench, the Fishes famous Physi-
 tian: And when the Pike is sick or hurt, he
 applies himself to the Tench, and finds cure
 by rubbing himself against him.....

PLANTS.

An inquiry was sent to Sir Philberto Ver-
 natti in Batavia, S, p. 160, asking

.....Whether in the Island of Sambrero.....
 Northwards of Sumatra.....there be found.....a
 Vegetable.....which grows up to a Tree, shrinks
 down, when one offers to pluck it up, into the
 Ground, and would quite shrink, unless held very
 hard? And whether the same, being forcibly
 pluck'd up, hath a Worm for its Root, diminish-
 ing more and more according as the Tree groweth
 in Greatness; and as soon as the Worm is wholly
 turned into the Tree, rooting in the Ground, and
 so growing great? And whether the same plucked
 up young turns, by that time it is dry, into a
 hard Stone, much like to white Corral?

Sir Philberto answered: "I cannot meet with any that ever heard of such a Vegetable."

PLANT SIGNATURE.

On June 20, 1670, T, "Hermanni Grube M.D." in a book on medicines

.....taketh notice.....That neither the outward Signature is to be totally neglected; since the Antients thereby did first discover, that Hypericum was good for wounds; Pulmonaria for the Lungs; Saxifraga, for the Gravel, Walnuts for the Distemper of the Head. Where he notes, that these signes do not so much respect the parts of the Body, as their Distemper.....

On April 26, 1675, T, a review of a book praising alchemy and dispraising Aristotle said that the author, Olaus Borrichius,

.....discoursing of the Signature of Plants, concerning which Conringius affirms, that not any footstep of it is to be found in all Antiquity; our Author alledges to this famous Antiquary several passages out of Dioscorides, and Pliny, clearly evincing the mistake of his Adversary
..... 1

In January, 1694, T, Signor Boccone in his book of

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1. Hermann Conring (1606-81) was a Hermetic philosopher. Borrichius, of course, was right about references to plant signatures in "Antiquity" - see the subject as treated in Chapter Three.

"natural observations" mentioned "the wonderful Texture of the Root of the Perfoliate Alpina latif. min. Bauhini, made up of many Membranes curiously complicated together; by which Signature he supposes it good for Ruptures....."

POISON.

It was inquired of Sir Philberto Vernatti in Batavia, S, p. 161, whether the

.....Indians can so prepare that stupifying Herb Datura, that they make it lye several Days, Months, Years, according as they will have it, in a Man's Body, without doing him an hurt, and at the end kill him, without missing half an Hour's time?

Sir Philberto answered that the Chinese used to make a drink of datura, but it had been banned. Asked whether those "stupified" by datura were "recovered by moistning the Soles of their Feet in fair Water", he replied, "No. For I have seen diverse Soldiers and Mariners fall into Rivers and Ditches, being stupified by their Drink aforesaid, who were rather worse after they had been taken out, than better." It was further inquired of him, S, p. 164,

What Poison is it the King of Macassar in

Colebees is said to have.....which not only kills a Man immediately.....but also within half an Hour's time, makes the Flesh, touched with it, so rotten, that it will fall like Snivel from the Bones, and whose poysonous Steam will soon fly up to a Wound made with an unpoisoned Dart, if the Blood be only in the slightest Manner touch'd with a Dart infected with the Poison?

He replied:

That there is such a poison in this King's Possession is most certain; but what it is, no Christian hitherto ever knew right..... Some say it is the Gall of a venomous Fish, others say it is a Tree..... That a Wound should be infected by this poison, tho' not inflicted by an im poisoned Weapon, is not strange to those who study Sympathy; and set Belief in that much renowned sympathetical Powder of Sir Kenelm Digby. Yet such Effects of the Macassars Arts are unknown to us.....

Finally, S, p. 164, it was inquired of Sir Philbert to "whether in Pegu and other Places in the East-Indies, they use a Poison that kills by smelling" To this query, "no Answer was return'd".

PORCUPINE.

On November 20, 1676, T, a review stated that Tavernier's "Observations concerning some of the most considerable parts of Asia" declared that "Porcupins kill Lions, by darting into their body

their quills....." On February 10, 1683, T, a review of a book on animals by Borelli noted that he termed the belief that porcupines can shoot their quills a vulgar error, and stated

.....that the Porcupine does not shoot out its Spicula, but by keeping them erect doeth shake and brandish them by the help of its Muscular outward Skin, and the semi-lunar Muscles with which the inner Skin is accompanied, which erect and shake the roots of those Spicula.....

And in October, 1687, T, a book by the Royal Academy of Paris, "Englished by Alexander Pitfield, Esquire, R.S.Soc.," stated that the porcupine's skin was provided with an "extraordinary Muscle for Ejaculation of the Quills".

POSSUM.

On March 2, 1698, J, Dr. Tyson gave an account of the opening of the body of a possum. "He found the parts of generation little differing from other Animals and yt. it was not possible for the young ones to be conceived or bred in its pouch...."

PRENATAL INFLUENCE.

On June 3, 1667, T, a letter from Paris,

author unnamed, described a "Monster in form of an Ape" reportedly born to a woman who had "seen on a Stage an Ape....." The letter concluded:

The Woman.....was found to have gone five months with Child, before she had met with..... that unhappy sight. Many questions were on this occasion agitated: viz, about the Power of Imagination; and whether this Creature was endow'd with a humane Soul; and if not, what became of the Soul of the Embryo, that was five months old.

On May 18, 1668, T, an "account" communicated by "that Worthy and Learned Divine Dr. William Holder" stated that "a Young Gentleman, known to divers of the R. Society, was born Deaf, and continued Dumb till his Age of 10. or 11. years" because his mother "when she was great with him, received a sudden fright....." On December 13, 1669, T, Theodore Kerkringius of Amsterdam in a collection of observations said that a woman who was "exceedingly frightened at the hearing of her Daughters falling down Stairs upon her Head.....was a few days after delivered of a dead child, wanting the whole Bone of the said part....." On June 17, 1672, T, Swammerdam in a book about women told "a very odd History of the force of Imagination in breeding Women": a woman who was frightened by the sight of a Negro went and washed herself "from top to toe", and was

afterwards "delivered of a child that was indeed white, yet those parts excepted, where the water in the washing had not touched". On March 25, 1674, T, a book of medical miscellanies from Germany, author unnamed, spoke of a child born without brains, "the mother having.....seen men fight, and one of them wounded in his head," and of three pregnant women,

.....whereof one, longing for Strawberries..... was the next day deliver'd of a child whose back seemed to be sprinkled with whole and fresh Strawberries; the other, who longing for green herbes.....was the next day brought to bed of a child, the crown of whose head lookt as though covered with small pieces of green herbs cut; the third.....longing for wheaten flower..... brought forth a child.....that held in his knit fist something like dry flower.....

In August, 1687, T, a "relation" of "Mr. St. George Ash R. Soc. S. who had seen the thing" described "one Elizabeth Dooly of the County of Kilkenny" as having on her temple "a piece of Flesh resembling a Cows Teat" exactly in the place where her mother had been frightened and hit by a cow, and "this," the relation concluded, "is lookt upon to be as strange an instance of the strength of imagination as can be produced". Several other exceedingly strange instances of this alleged strength of

imagination were produced in the Society's seventeenth century records, however. On February 9, 1687, B,

.....the Earl of Pembroke related, that he had read in the Recherche de la Verite the story of a child whose mother having seen a man broke on the wheel, when big with child, was delivered of it, having as it were, a joint in all those places, where the malefactor had his limbs broken.

On February 19, 1696, J,

A letter from Mr. Cyprianus from Amsterdam was read giving an account.....of an Infant bornwith a great Wound in the Breast occasioned by the Mothers having been greatly Surprized at the News of a Man having murdered his Wife by such a Wound, Doctor Bidloo being present disputed against the supposed effects of the Imagination upon the Foetus affirming that it was absolutely impossible that Such Effect should be produced unless the Embryo were Affixt to the Uterus by very remarkable Vessells, whereas it is not so, but only by the Vasa umbilicalia to the Placenta..... Halley related the Case of one Mrs. Colson who having been in great danger of receiving a Kick from the Heel of a Horse as she passed behind him went home and Miscarried of a Child, that was Exceedingly black and Seemed bruised in the Belly where the Mother apprehended the Blow.....

PYGMY.

In September, 1699, T, Dr. Tyson in a treatise concluded that "the Pygmies were not a diminu-

tive Race of Mankind.....but this Creature....."
 ("This Creature" he had described as a "kind of
 monkey".)

RATTLESNAKE.

On December 17, 1662, B, "Mr. Winthrop.....
 shewed also the tail of a rattlesnake, which, he
 said, increased every year by one ring..... Dr.
 Merret took it home with him, to make some trial of
 the powder of it....." On October 26, 1664, B,

Dr. Merret affirmed, that he had examined
 the teeth of a rattlesnake.....and observed,
 that they were very visibly hollow, with a small
 perforation running through the middle of them
and that he had farther proved them such,
 by thrusting a hog's-hair through them.....

and Dr. Merret concluded that since a rattlesnake
 was like a viper in all its other parts, "it was
 not unlikely but the teeth of them might also re-
 semble each other". On July 15, 1672, T, John Jos-
 selin recommended as a remedy for rattlesnake bite
 "bruising its Liver and applying it to the wound
" And Grew, p. 51, wrote concerning the
 rattlesnake,

.....those that are bitten with him, sometimes

die miserably in 24 hours; their whole body cleaving into chops..... And for there being any Venime in the Rattle, it was I believe, hardly ever imagin'd by any other man. It is affirmed.....that as many years old as the Serpent is, the Rattle hath so many joynts. Which if it be true, then they will live at least sixteen years, some Rattles (as this here) consisting of sixteen joynts. Which makes the Tradition very suspicious.

(For some other Society considerations concerning the rattlesnake, see "Dittany" and "Viper".)

RHINOCEROS.

Among the queries submitted to Sir Philberto Vernatti in Batavia, S, p. 167, it was asked, "Whether the Animal call'd Abados, or Rhinoceros, hath Teeth, Claws, Flesh, Blood, and Skin, yea his very Dung and Water, as well as his Horns, antidotal.....", and Sir Philberto replied, "Their Horns, Teeth, Claws, and Blood are esteemed Antidotes, and have the same Use in the Indian Pharmacopeia as the Theriaca hath in ours....." ¹ On March 25, 1673, T, a review of Redi's book of ex-

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1. "Theriac" was a popular cure-all "even up to a hundred years ago," states Haggard, op. cit., p. 337. "It contained from thirty-seven to sixty-three ingredients, all of which are worthless as remedies. The main ingredientwas the flesh of vipers."

periments declared that the author had investigated the stories "that the Blood of a Rhinoceros doth marvels in curing the Colick..... The Decoction of the skin.....is very stomachical; and the Horns of it very Antidotal. All which he found groundless in his frequent Tryals....."

ROC.

Hans Sloane reported, T, 2/94, that a sea-captain had told him that single condors had "oftenassaulted Boys of Ten or Twelve.....and eaten them....." (The giant condor of the Andes was thought to be fabulous when first reported, and John Ray "at one time considered the condor the mere offspring of fiction, and dared not insert the bird in Willughby's Ornithology". Adams, Travellers' Tales, p. 253.)

ROMULI.

On February 3, 1664, B,

Mons. Vossius (Isaac Vossius, later Canon Windsor) communicated a relation of a child taken in Lithuania among bears in a bear-hunting, and then at the court of the queen of Poland,

where endeavours were used to reduce the child to some humanity, whence it seemed to have altogether degenerated by its long conversation with wild beasts..... Sir Robert Moray was desired to make farther inquiry into the fact.....

On July 17, 1671, T, a book, Philosophus Autodidactus, "translated out of a fair Arabick Manuscript" by "Edward Pocock, Oxford," was said to be

.....a very ingenious.....Faigned History of an Infant exposed.....on an Island not inhabited; where he was nursed up by a Gazel.....and coming afterwards to years of knowledge, did by his single Use of Reason and Experience.....excell their studied Philosophers.....

In March, 1698, T, the account of a book on Poland by "Bern. Connor F.R.S." stated

.....he gives the Relation of several Children that have been bred up and suckled by the Bears, with their Cubs, with Observables of their eating raw Flesh, wild Honey, and Crabs; with the Difficulty of making them go Upright, bringing them to Speak, and the like.....

ROOSTER.

On August 20, 1684, T, "Francisco Moncaeo" in a book on magic was said by the reviewer to have repeated the story of "Petrus Gregorius and Merkerus that on the outside of the brain of a Cock. Lillies are drawn, or imagined to be drawn, alwaies

one, and sometimes to the number of three....."

RUE.

On February 22, 1675, T, it was inquired "whether hands rubbed with Rue, will thereby be secured from the biting of Vipers, Scorpions, &c," and "whether Rue hung round about the place, where Poultry roosts, will keep Weasels and Cats from hurting them". Neither inquiry was answered in subsequent seventeenth century issues of "Phil. Trans."

SALAMANDER.

On June 27, 1666, B,

Dr. Croune.....related, that there was a salamander sent to the great Duke of Florence, which being sick was cast into the fire, where vomiting out a certain stuff, it put out the fire, and then seemed to lie there quietly. This was confirmed by Mr. Boyle and Mr. Willughby, as to other salamanders; and the latter of these two having proposed.....to try what they would do, when cast into the fire, it was ordered, that some both water and land newts should be provided by the operator against the next meeting.

Apparently the operator did not provide any newts against the next meeting, for the only other discussion of salamanders that year occurred on July 11,

B, when

Dr. Croune.....produced a letter, written to him by Nicholas Steno.....mentioning.....that the Chevalier Corvini had assured him, that he had cast a salamander, brought him out of the Indies, into the fire; whereupon the animal swelled presently, and then vomited a good quantity of thick viscous matter, which put out the neighbouring coals, whither the salamander retired presently, putting them out again the same way as soon as they rekindled, and by this means saving himself from the force of the fire for the space of two hours.....that he.....kept it eleven months without any other food than what it took by licking the earth.....which was brought out of the Indies; which.....being dried afterwards, the urine of the animal served to moisten it. At the end of eleven months, when the owner had a mind to try how it would do upon Italian earth, it died three days after the earth was changed.

SCORPION.

On July 13, 1687, J,

.....the minutes of the Dublin Society.....were read.....it being said in those minutes that a bruised Scorpion was a sure and speedy remedy for the sting of a Scorpion, Sr. John Hoskyns said that he had heard that after the same manner the sting of a wasp might be cured by applying the bruised wasp.

SERPENT.

On September 26, 1675, T, the "Learned Author" of a "philosophical discourse on fermenta-

tion", Dr. Sympson of London, according to the reviewer

.....ascribing.....all the poysonous properties of Venemous Animals to the invigorated ferments of their juices, raised to that height, as to become poisonous fire.....endeavours to give an account of the effects of those Fiery Serpents, we read of in Holy Writ, and of that matter called Gecco, vomited by some sort of venemous creatures, upon their being whipt and hung up (which exasperates their ferments;).....

Thomas Glover in an "Account of Virginia," 6/20/76, T, wrote: "There are also long black Snakes, short and thick black Snakes; this latter sort often times sucks the Cows, and cause them to give bloody milk....."¹ Grew listed the skin of a "Boiguacu", a Brazilian snake which attained a length of "thirteen yards" and was

.....so big (according to Joh. de Laet.), as to swallow a Stag whole, horns and all..... This Serpent, says Piso, will thrust his Tail up a Mans Fundament, and gird him about the middle till he kills him. Yet it is probable, that they communicate no Venime by their Tail, but only are so cunning as to use that way, whereby to take the faster hold. 2

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1. For discussion of the fable of cow-sucking creatures, see "Caprimulgi" in Chapter Three.
 2. Breland, Animal Facts and Fallacies, passim, says the reticulated python may grow to a length of 35 feet. A boy of fourteen was swallowed by a python and "it is believed that an animal weighing 150 to 175 pounds is about all that even the largest snake can swallow".

John Clayton in his account of Virginia,
5/94, T, declared

.....the Horn-Snake is, as they say, another sort of deadly Snake; I never saw any of them, unless once.....which I cannot attest to be the Horn-Snake, for I could not distinctly view it, being in a Thicket..... I could not see the Horn, which they say it has in its front, where-with it strikes, and if it wounds, is as deadly as the Rattle-Snake's bite. The Gentleman that was with me, told me it was a Horn-Snake; but being in hast, and on Horse-back, and the Snake in a Thicket, I could not see the Horn.....

(For other Society considerations of various kinds of serpents, see "Dragon" and "Rattlesnake". On December 4, 1661, J, "the Amanuensis produced Serpents which being fired, and cast in the water, burnt there to the bounes....." - which Birch recorded as ".....burnt there till they bounced". But these were "artificial" serpents.)

SHARK.

On July 6, 1692, J, "it was alledged thatit was a Vulgar Error that they (sharks) do Swallow their Young upon a fright, for that it is never found but the Young Ones are attached to the Mother by the umbilical vessels....."

SPIDER.

On February 11, 1667, T, Nathaniel Fairfax in a letter "alleges Examples of several Personswho have frequently swallow'd Spiders, even of the rankest kind, without any more harm than happens to Hens, Robin-red breasts, and other Birds, who make Spiders their daily Commons". On June 19, 1671, T, Martin Lister presented a "Set of curious Inquiries about Spiders", posing among other questions these: "Whether they kill Snakes too.....for food or delight? Whether Spiders be a cure for sick poultery.....?" On February 20, 1689, J,

.....there was read part of a large letter from Mr. Cole of Bristoll wherein he gives a curious account of some Observations of the fall or rain of small Spiders, and Gosswebb..... These he supposes to have had their Originall from a Species of Animalls which are Inhabitants of the Air, and rarely Descend to the Earth, or Else to be produced by Equivocall Generation, for which he argues..... 1

SPONTANEOUS GENERATION.

The early Royal Society was very concerned

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1. For other discussion of "Gosswebb" and "Equivocall Generation", see "Gossamer" and "Spontaneous Generation", Chapter Three.

about the possibility of spontaneous generation. In its official publications of the seventeenth century, the subject was discussed in seventy-one different articles and papers; possibilities considered included production of various creatures, usually insects, from "sperm of the world", the earth itself, "seminal principles", or something like seeds "dispersed through the air", putrefying flesh, vegetables, wood; cheese; dog blood, ox blood, rat urine or eel liver; horse dung; goslings, rain water, May dew, grain, oak galls, cloth, Venice treacle, dust, sweat, the bellies of men, and other substances living or dead. In general, the tone of the discussions changed during the period 1662-1700 from credulous to sceptical. The first entry, October 22, 1662, B, described a consideration of the possibility of "what is called equivocal generation.....by certain seminal principles" or by "seeds, or something analogous to them, dispersed through the air," and concluded by directing that "several experiments should be tried, of putting blood, flesh, brains, &c. together in a glass or other proper vessel; as also bran and meal; and likewise cheese moistened with sack....." The last spontaneous generation

entry of the period occurred in a letter from
Leeuwenhoeck, T, 10/1700:

You know, Sir, that my Hypothesis is,
that no Creatures that have Life, can be pro-
duced by themselves, wherewith I imagine that
many have been satisfied, especially such as
have seen what I have already advanced about
the Seeds of Plants.....

Space limitations forbid reproduction of
more than a tithe of the intermediate considerations
here.

On March 18, 1663, B, "Mr. Evelyn.....un-
dertook.....to put several pieces of flesh and some
blood in a closed vessel, which might not be fly-
blown, to see what it would produce". On July 6
of the next year, B, "Mr. Evelyn gave an account,
how the flesh.....put up in the glass, covered with
double flannel, had bred no live creatures, but
turned into a mucilage, and then dried up". ¹ On

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1. Mr. Evelyn was apparently not an enthusiastic investigator of fables. There are few references to natural history legends in his Diary - this spontaneous generation experiment is not referred to there. Pepys was less of a scholar and slightly more naive; he wrote of a "monster got of a man and a she-baboon" (8/24/61), and of "Swallows.....often brought up in nets out of the mudd from under water" (12/11/63) - see "Swallow" infra - and of serpents charming larks out of the air, and of tarantulas "most busy" at harvest time (2/4/62), and of various "charms" against illness.

May 8, 1665, "Master Thomas Henshaw.....having several Tubs with good quantity of Dew in them, set to putrefy.....found in the water a great bunch.....of those Insects commonly called Hog-lice or Millipedes" On May 6, 1667, T, "the Inquisitive Dr. Merret", describing a method of keeping rats and mice out of granaries, said some such preventive measure was necessary "for besides the devouring of the Grain, the Excrements and Urin of that Vermine, moistning the Wheat or Rye, make them apt to corrupt and breed Weivels....." On the same day, T, it was inquired of "Guiny" concerning the rain "rotting the Cloaths.....and breeding Worms in them?" On March 25, 1670, T, the reviewer of Redi's important book of experiments said:

The Learned and Ingenious Author..... doth with much industry undertake.....to evince, that there is no such thing as Aequivocal Generation, but that every Animal is generated by the seed of another Animal, (its parent,) or, at least, from some Living and uncorrupted Plant, as out of Oak-Apples..... The Author positively affirms, that he could never find, by all the Experiments and Observations, he ever made (of which he relateth a great number) that ever any Insects were bred from Flesh, or Fish, or putrified Plants, or any other Bodies, but such as Flies had access unto, and scatter'd their seed upon..... Secondly, to make out the other part of his Position. viz. That those Animals that are not bred of other Animals, are produced from

some live Plant, or its Excrecence; this Author esteems it not absurd to affirme, that that Anima or Power, which is able to produce Flowers and Fruits in living Plants, may be like capable to breed Worms in them; since that Soul is so powerful, as to cause Plants to feed, to grow and to produce seed, as it doth in Animals..... Having establisht this ground against Aequivocal generation, he proceeds to particulars, and refutes the opinion of those, that will have Bees to be bred of the putrified flesh of Bullocks; Wasps, of Asses or Mules flesh; Drones, of Horses; Scorpions, of buried Crayfishes, or the herb Basilica, or dead Scorpions: Toads, of Ducks buried in Dung; Mites, of cheese, affirming that none of these Insects have any such origin mentioned, but that all those substances have been first blown upon by some Flye or other..... He intersperseth through the whole Book many curious and considerable Observationsthat there are no Animals.....half animated and half wood.....that worms breed in the Livers of Mutton, and the Heads of Staggs, he having seen divers of them.....and esteeming, that the soul of the superiour animal was able to breed those inferiour animals.....

On October 10, 1670, T, Swammerdam in a book about generation of insects, according to a review, "declareth his sentiment, that there is no Generation in Nature, but only a Production by the Growing of Parts....." On August 14, 1671, T, John Ray in a letter about "Spontaneous or Anomalous Generation of Animals" said "It seems to me at present most probable, that there is no such thing; but that even all Insects are the natural issue of parents of the same species....." On December 7, 1671, B,

Dr. Walter Needham read part of a letter from "Mr. Templer.....endeavouring to confirm what he had formerly related about the breeding of insects in the Livers of eels dried and closed up....." On December 20, 1677, B, to a statement that certain "little creatures" came from seed or eggs,

Mr. Oliver Hill replied, that there was no need of any such thing as a seed or egg, since there was a spirit of nature, which was everywhere; and when it found fit matter to work upon, there it produced an animal. When it was objected, that there had never yet been any certain experiment.....of the production of an animal, where might not be shewn very good reason to believe, that there was a seed or egg for its cause: he answered, that he could easily shew an experiment.....which was, that he could take May dew, and put it into a glass, and seal it up hermetically; and then by ordering the glass in such a way, as he well knew, he could in time produce therein an animal six inches long..... 1

On January 16, 1679, B, "Sir Jonas Moore remarked, that.....Brebell (not identified) had an art, by

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1. After this discourse on the "spirit of nature" Mr. Oliver Hill "read a written discourse of his, about the method, which the Society ought to take in their proceedings, much differing from what they then followed". He did not produce evidence of success of his May dew experiment, but on the following January 3, B, "affirmed, that there was no such thing as gravity in the air; but that air was positively light; and that all, who believed otherwise, were mistaken, and in a great error".

which he could produce a fly in an hour's time any where". Grew in his Catalogue, p. 155, wrote:

"All that Authors speak of the Spontaneous Generation of Bees, is fabulous." On May 10, 1683, T, "an ingenious Physitian, a Fellow of the Royal Society," in an account of a dissection of a bitch derided the possibility of spontaneous generation and asked, if such a thing could be,

Why does not so great a diversity of putrid parts in the Earth, differently affected by unaccountable accidents, often present us with new living Creatures.....? If the Earth at first equivocally produc't Men, Quadrupeds, Birds, and Fish, why has it not done it very frequently or at least sometimes since? We begin to suspect the Cheat, when the Artist is not able to perform the same again.

On July 13, 1693, J, there was

.....much discourse concerning Equivocall Generation, Some thinking it absolutely necessary to solve the Phaenomena of the various sorts of Worms in the bodies of Animals, and even of Men, others supposing it altogether impossiblebut no positive Conclusion was agreed to

In October, 1694, T, Leeuwenhoeck in a letter stated, "I conclude there is no Generation but from the Parent Animal", and on January 16, 1695, J, in another letter he called the spontaneous generation

hypothesis "most absurd and unreasonable not to say Ridiculous". In August, 1696, T, in a letter to Leeuwenhoeck, Huygens declared, "I am very much pleased.....the plainer you prove the Generation of Animals by Seed and not Corruption, and I am also of the same Opinion".

STAG.

On September 21, 1668, T, in a book about stags, "Joh. Andrea Graba, Jena," conjectured that the longevity of this animal was due to "the plenty of Balsamick preservative Salt, with which 'tis said Nature hath stored this above many other Animals". He then listed a "vast number" of "medicinal uses" for "Stag's tears, blood, urine, dung", but above all these commended "the volatil Salt and Spirit made of the horns and blood of Stags....." The reviewer of Redi's book of experiments, T, 3/25/73, wrote that the "Observing Author" declared that blood from a stag's horn "coagulates like the other blood of the Stag.....though this be denied by Aristotle and Galen....."

STARSLIME.

On November 2, 1664, B, "Dr. Merret produced some of the substance commonly called a star-shoot.....(because).....the vulgar, seeing that meteor called a star-shoot, and running to the place, where they think it fell down, and where easily they meet with this matter, judge it to be the star-shoot itself". There was a discussion, and

.....some conceived, that it was a mucilaginous matter of a fungus.....others were of opinion, that it might be some spermatic matter of rams, copulating with ewes.....others thought, that it might be frogs dissolved, especially since sometimes bones were found in it.....

On April 2, 1684, B,

Mr. Henshaw.....remarked.....that star-slime is found where cattle go, as conceived to come from the females. Dr. Lister conceived, that star-slime is nothing but frogs dissolved and putrified in the air, being taken out of the water in the winter-time by the crows, and lost upon the ground; and he observed, that he had often found the bones of frogs in them.

STORK.

On August 20, 1684, T, the reviewer of Moncaeo's book on magic stated that the author

takes occasion to discourse about the winter quarterings of the Storks, whether or no they go to, and come from distant regions as the seasons of the year require..... But having confuted this opinion.....concludes they do not fly to warmer climates, but, like other animals, both birds and beasts, come from hidden places in the same country, where during the cold they lye asleep. And afterwards gives as many reasons for it, as there are letters in Hibernaculum Ciconiarum, and that too in the Acrostick way, each sentence beginning with a letter of those words, according to their order. Then he mentions some other observations concerning them, viz: that they will not build upon a Jewes house; that they have been seen industrious in quenching fires by taking water up in their bills, and emptying them into the flames &c.

STURGEON.

Grew in his Catalogue, pp. 101 f., wrote:
 "It is affirmed by Moufet, That the Scales of a Sturgeon turn towards the Head; borrowing his Error herein of Pliny."

SUN BLACKENS.

On September 26, 1675, T, Martin Lister gave some observations of "the Learned Dr. Thomas Towns" of Barbados:

The Blood of Negro's is almost as black as their skin.....so that the Blackness of the Negro's is likely to be inherent in them, and

not caused by the scorching of the Sun.....
 Much farther to the North there are People,
 that cannot brag of much clearer skins than
 the Europeans; so that Complexions are no
 less Cold-burnt (if I may so phrase it) than
 Sun burnt.

On November 1, 1677, B, "Mr. Leewenhoeck's papers
were read.....the particulars of which were
that the cause of the blackness of Ethiopians
 is from the constitutions of the pores, that will
 not admit light....." On April 12, 1682, B,

.....it was likewise urged, that there are many
 of the Jews black, who yet are very strict in
 not mingling with other nations; and that Eu-
 ropeans, by continuing to inhabit in Africa,
 have been found to turn black, and that Blacks
 in England, after a few generations, become
 white.....

SWALLOW.

On January 21, 1663, B, "Mr. Boyle.....
 took notice, that swallows live under frozen water
 in the Baltic sea," and on January 6, 1664, B, "Mr.
 Boyle remarked, that swallows frozen up in ice, up-
 on the thawing away of the ice, had been found alive,
 and flying about; and that a minister had sent a
 certificate of this to the king from Dantzic". On
 January 13, 1664, B, "the experiment of freezing

swallows by lapping them up in paper, and by putting snow and salt about them, was ordered to be recommended.....to Mr. Beal....." On November 19, 1666, T, it was inquired of Dantzig "what truth there is in that relation concerning Swallows being found in Winter under waters congealed, and reviving, if they be fish'd out and held to the fire?" and "M. Huelius" answered, "concerning Swallows, I have frequently heard Fishermen affirm, that they have here often fish'd them out of the Lakes, in the winter; but I have never seen it myself," and "Prof. Schefferus" answered ".....Swallows sink themselves towards Autumne into Lakes, no otherwise than Frogs; and that many have assured him of it, who had seen them drawn out with a Net together with Fishes and put to the fire, and thereby revived....." On June 15, 1668, T, Dr. Stubbes reported that "The Swallows in Jamaica, as hot as 'tis, depart in the Winter-Moneths....." Willughby in his Ornithology, as reviewed 12/27/75 in "Phil. Trans.", stated that "Swallows, distilled with some Castoreum, Pyony roots, and White-wine, are an approv'd remedy against the Epilepsy, &c....." On May 4, 1687, B, "Mr. Henshaw observed" that watermen had told him

they had found swallows in the Thames, and "that towards the end of the year they assemble in great numbers of the little islands of the river, and then submerge themselves in the water". A week later, B,

Mr. Henshaw remarked, that Dr. Harvey had considered the state of swallows in the winter, and had dissected some of them which had been found under water, and could not observe, that there was either warmth or motion in them. It was ordered that it be inquired from Sweden and the Sound, whether there be no fluid blood to be found in those frozen swallows, which are said to revive there upon being brought into a warm stove. Mr. Chetwynd.....observed, thatswallows.....laid up for the winter..... moult, and return in the spring with all new feathers.

On April 10, 1689, J, Hooke, considering "the flight of swallows, and other Birds.....thought they steered their course over great Seas by following a warmer Air rather than from their taking notice of any land marks or the Like in their flight," and Evelyn said he had seen swallows "fall like Rain into the Sedge, where he thought they remained in the water for the whole winter....." On April 17, 1689, J, "Mr. Henshaw conceived that frozen Animals such as froggs Swallows &c. must be thawed.....by a very gentle warmth.....Least the Ice should destroy the

Texture of the parts....." On November 13, 1695,

J,

An account Confirming the Reports of Swallows being fisht up in the Lakes and Fresh waters.....in Prussia was read, and that they are taken up in clusters as it were Glued together with their Feathers on, and being brought into a warm Stove they will Revive and fly about, but are Observed not to live long after.....

In November, 1697, T, a letter from Thomas Molyneux concerning vexatious swarms of insects in Ireland stated: "Where they go (at the end of summer) is made a Question, some thinking they take their Flight like Swallows.....to a more distant Country and warmer climate....."

TARANTULA.

On April 13, 1668, T, a review of a book by "I.W.Sengwerdius" detailed this author's theory of "tarantism" thus:

The poison, which being viscous and tenacious, exserts itself not presently, but lurks a good while in the body; and after the revolution of a year, being stirr'd and subtilized by the heat of the Sun, is rowsed and put into motion, producing for the first two years only various diseases in the patient.....

After the various diseases there followed

.....very strange and surprizing effects, in some singing and laughing; in others, weeping and crying; in others, sleeping; in others, continual watching; in some, vomiting; in some dancing and sweating; in some, madness; in some, the fancy of being Kings; in others, that of being slaves..... This only he affirms to be common to all that are bitten by the Tarantula's, that they delight in Musick, and are thereby moved either to dance, or to gesticulate..... Not every one is affected with every song, but each with such an one, as is suitable to his temper.....

On November 20, 1671, T, Martin Lister suggested that this query be sent to Italy:

.....whether the person bit by a Tarantula, be not ever, when on his feet, disposed to and actually dancing after the manner of a Phalangium, (a ".....six-eyed skipping Spider") which never moves but by skippings; even as it happens with such that are bitten by a Mad Dog, who have been sometimes observed to bark like a dog, &c. And if so, what are we to think and credit concerning such and such Musical tunes, said to be most agreeable and tending to the Cure of persons bit by a Tarantula?

On February 8, 1672, B, a letter from "Signior Cornelio" of Naples said that

.....the stories related of the odd effects of the tarantula's stinging were in his opinion fictitious; and that, from his own observations, he was induced to believe, that without any preceding bite of that insect, such symptoms befal many of those people who live in Apulia, a very dry country, and are often tormented with an excessive and long thirst.....

A week later, B,

.....the business of tarantula's.....being again mentioned, and some of the members remarking, that it would be hard to accuse of fraud or error.....good authors, who had delivered.....so many mischievous effects of the bite of tarantula's, it was ordered that the secretary should desire to know of Dr. Cornelio, who denied such effects, what he could say of the writings of those famous men concerning this matter.....

On May 20, 1672, T, a letter from Dr. Cornelio stated:

Now the time approaches, that I may send you some Tarantulas. Mean while I shall not omit to impart unto you, what was related to me, a few daies since, by a judicious and unprejudicate person, which is.....that all those who think themselves bitten by Tarantula's, (except such, as for some ends fain themselves to be so,) are for the most part young wanton girles, (whom the Italian writers call Dolci di sale,) who by some particular indisposition falling into this melancholly madness, persuade themselves according to the vulgar prejudice, to have been stung by a Tarantula..... Of this I hope I shall soon be able to write my thoughts more fully, which will, I think, be sufficient to refute that fable of the Tarantula.

In February, 1699, T, the reviewer of the book Museo di Fisica & di Esperienze, by Signor Boccone, disagreed with the author, and stated:

Notwithstanding what our Author hath written, I am not fully satisfied, that the Dancing of the Tarantati to certain Tunes and Instruments, and that these Fits continue to recurre Yearly, as long as the Tarantola that

bit them lives, and then cease, are any other
 than acting Fictions and Tricks to get Money
 1

TOAD.

On June 5, 1661, B, Sir Kenelm Digby "re-
 lated, that the calcined powder of toads rever-
 berated, being applied in bags upon the stomach of
 a pestiferate body, cures it by several applica-
 tions". On April 22, 1663, B, Mr. Long "mentioned
that bay-salt being thrown upon toads would
 kill them. He was desired to make the experiment
 with common salt, or any vegetable or mineral salt
". Mr. Long again "mentioned", B, 4/29/63,
 that "toads, though they are not venomous in the
 cool and moist season of the spring, yet are so in
 the heat of summer.....". And, he added, "a toad
 in the height of summer being broken, infects and
 poisons with its very steam.....". On May 6, 1663,
B, ".....a toad and slow worm were killed by throw-
 ing salt of tartar and common salt upon them....."

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1. It is interesting to note that in this as in
 many other "Phil. Trans." seventeenth century
 "accounts" of books there may be detected a
 critical objectivity which foreshadows the
 literary criticisms of Addison and Steele.

On May 13, 1663, B

Sir James Shaen was desired to take care, that English earth and toads be sent over into Ireland.....to try, whether toads do presently dry upon Irish earth; as also to have some Irish earth and wood transported into England, to examine what is in them peculiar.....

On May 20, 1663, B,

Col. Long.....suggested a means of driving frogs and toads out of ponds, as well of stagnant as running waters, by burning old shoes, and putting them at the head of the pond where the water comes in; affirming to have seen them come out by hundreds upon the use of this trick. 1

A week later, B, Colonel Long "observed, that the grass was blasted where toads live....." (Cf. the "blasted heath" of Macbeth's witches.) On March 9, 1664, B,

Dr. Merret produced a fish called lupus marinus.....which hath double teeth.....serving to discover a vulgar error concerning toad-stones, which the doctor said to be nothing else but the teeth of this kind of fish,

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1. It was thought that old shoes had other good uses too. "When Robert Boyle expurgated the pharmacopeia of its most dubious remedies he nevertheless included in the revised list the sole of an old shoe 'worn by some man that walked much', which was to be ground up and taken internally for dysentery". Haggard, op. cit., p. 328.

having shewn them to several goldsmiths.....
and made several chemical trials upon them.....
Mr. Palmer, Mr. Haak, and others, who had toad-
stones, were desired to produce them at the
next meeting, to compare with these teeth.....

On March 14, 1666, B,

Dr. Clarke remarked, that Dr. Dickenson
had put a toad into an open glass, wherein it
lived six months without any visible food, but
after that time died, and dissolved into a
jelly, which the next spring produced two live
toads, which he kept as he had done their pa-
rent before; and that they also dissolved at
last into a liquor; but that out of this li-
quor no other toads were generated.

Monsieur Charas (of whom more, under "Viper") in his
book of experiments on vipers, T, 5/20/72,

.....alledgeth the imagination of terroure by
a Toad impressed in a Ferret, which having
seen and been seen by that ugly Animal at a
certain season of the year, and that alwaies
in Summer, cannot avoid running round about it,
crying out aloud as if it call'd for succour,
whilst the Toad remains unmov'd with its throat
open, and being at length, by that imagination,
forced to surrender it self into that throat;
as he affirms to have seen himself, and to
have even kill'd the Toad at that very instant,
and so saved the Ferret, which ran away.

In October, 1686, T, Robert Plott, in his book on
the natural history of Staffordshire, "produced"
many instances of toads being found in trees and
stones, accounting for such phenomena by supposing
that the toads were "enclosed in a narrow Rift in

winter, which afterwards closing too hard, imprisons them there, without killing them; Toads having little blood, and very viscous juices, require not much perspiration....." On April 10, 1689, J, "Mr. Evelin said if you take a toad and Bury him in a pott, with his mouth upwards, he will Live a whole year and more, without any food only upon the Air" On June 9, 1692, J,

Mr. Houghton produced a letter from Mr. Thomas Machell Rector of Kirkby Thore in Westmorland mentioning a Toad found lately in a great Lump of Sparr 15 Fathoms under Ground. This Toad was alive in a Cell about the bigness of ones Fist. But being drawn up to the Open Air he Dyed immediately.....

and on the following June 22, J,

Concerning the finding of Toads in the middle of Stones, or of Timber perfectly inclosed so as to have no passage for fresh Airdivers doubted of the truth of the first Relators, and rather inclined to disbeleive their Relations, than spend time in Solving of that, of which they had no Credible proof of its Certainty.....

In June, 1694, T, in a "Discourse of the Viper, and some other Poysons", Sir Theodore Mayerne "laughs at the Poyson of a Toad, which he says he has none at all, no more then a Frog, and affirms he has

eat several without any mischief....." ¹ On April 30, 1695, J

Mr. Halley related that Mr. Bird the Stone Cutter at Oxford had informed him That in Sawing a great Block of Stone, he had foundin the middle a Cell of a harder substance that included a Toad of a greater Magnitude than the usuall Toads are. That Bishop Wilkins then Warden of Wadham College caused him to Cut out all the said Cell out of the said Stone, and That he Included the Toad therein, and buried him in his Garden, but that he soon Dyed.....

TORPEDO.

On March 25, 1673, T, the reviewer of Redi's book of experiments declared:

This Learned and Observing Author..... takes notice.....that the fish Torpedo causeth stupefaction.....only when he held and squeezed it, not at the least distance. The Fish he dissected, to see whether he could discover the seat and cause of its stupefactive power; and notes, that all that part of it between the gills and head, and the place where the fins are, as far as to the foremost extremities of the whole body of it, is taken up by a fibrous, soft and very white substance, the fibres being as big as sanguineous vessels.....

On March 18, 1680, B,

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1. Cf. Hudibras, part II, canto 1, ll. 753 f.:
 "The Prince of Cambay's daily food / is asp,
 and basilisk, and toad, / Which makes him
 have so strong a breath, / Each night he
 stinks a queen to death....."

Dr. Gale read an account of the numbing eel.....that as soon as the fish seizes the bait, the party holding the line finds his hand struck with a numbness, which suddenly pierces to his shoulder, and except he quit his hold immediately, thence to his heart, so that he falls down dead. That some unexperienced or forgetful persons have by this means lost their lives.....that whatever it be, that causes this numbness, 'tis of that active subtil nature, that when some persons being struck with it have fallen, their friends, who hasted to raise them, have for their officiousness been rewarded with a sense of the same, though they have touched no part of the line, but only the body affected.

On February 10, 1683, T, according to the reviewer, Borelli in a book about animal motion "confutes" the vulgar error about the torpedo

.....and gives his own experience that (the torpedo).....acts only by a Tremulous motion strongly impressed on the hand that toucheth it.....and adds this circumstance, that when with his fingers extended He obliquely toucht the Thorax of the Fish, he suffered nothing; but if with his fingers bended he received perpendicularly the vibrations of it, then he was affected.

On February 26, 1690, J, it was inquired "concerning the truth of the relation Numb Eel or Torpedo of Surinam said to numb the Limbs of the Fisherman when he strikes him with the Hook, though at a very great Depth of water....."

TREE.

On May 20, 1663, B, "Mr. Brereton.....mentioned.....that serjeant Newdigate had assured him, of his having often seen.....a tree cut in the middle, the heart of which was ash-wood, and the exterior parts oak....." It was inquired of Sir Philberto Vernatti in Batavia, S, p. 170, "Whether there be a Tree in Mexico, that yields Water, Wine, Vinegar, Oil, Milk, Honey, Wax, Thread and Needles?" ¹ Sir Philberto replied:

The Cokos Tree yields all this and more; the Nut, while it is green, hath very good Water in it; the Flower being cut, drops out great Quantity of Liquor, called Sury, or Teywack, which drank fresh hath the Force, and almost the Taste of Wine; grown sour, is very good Vinegar; and distilled, makes very good Brandy, or Areck: The Nut grated and mingled with Water, tasteth like Milk; pressed, yields very good Oil: Bees swarm in these Trees, as well as in others; Thread and Needles are made of the Leaves and tough Twigs. Nay, to add something to this Description; in Amboyna, they make Bread of the Body of the Tree, the Leaves serve to thatch Houses, and likewise sails for their Boats.

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1. This may have been the query that caused Stubbe to write: "Who can with any patience read how this famous Society sent to the Governor of Batavia in the East-Indies to know what grows in Mexico in the West-Indies? How poor and mean are their inquiries....." Stubbe, Legends No Histories, p. 2.

Redi in his book of experiments, T, 3/25/73, according to the reviewer

.....must acknowledge the virtue of the Bark of the Peruvian Tree in Gujachil, known by the name of China di China, curing Quartans and all sorts of Tertians. He wisheth, it were as true, what is recorded in the praise of those two Herbs of China, called Pusu and Gudseng, whereof the former is said to render men immortal, the other, to preserve them always in good health..... 1

On November 20, 1676, T, the account of Tavernier's book of travels in Asia stated that the author noted "that Craw-fishes do creep up on high of the white Mulberry-trees about Sun-set, eating the fruit; and break of day come down again into the Rivers, near which those Trees grow". On June 19, 1689, J, "A Stranger.....related.....that the bark of Dogwood of Jamaica will poyson the water so as to kill the Fish therein".

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1. Query: was "gudseng" ginseng? This herb is native to North America as well as to China, and is still thought by many to possess almost magical powers of healing. It has some resemblance to mandrake. The inscrutable Orientals used to export cunningly contrived imitations ginseng roots, while their brother Yankees were embedding nails in their growing ginseng roots, to make them weigh more - since they were sold by weight.

TURTLE.

On "Munday, Septem. 1667", T, "a curious and learned person" wrote from the "Caribe-Islands" that the "tortoises" of that area in summer went to the Cayman Islands and there did "coot for fourteen daies together", then layed "some three hundred Eggs", then did "coot again, and lay in the sand, and so thrice", after which "the Male is reduced to a kind of gelly within, and blind, and is so carried home by the Female". On March 16, 1668, T, it was inquired of the "Ant-Iles" whether the ashes of "the Freshwater Tortoise do hinder the falling of the Hair, being powder'd therewith?" On June 15, 1668, T, Dr. Stubbes reported that he had

.....examin'd that assertion of Mr. Lygons, that a Tortoise hath three Hearts, and I found it false. For, although the resemblance of the two auricles be such, as also their bodies of flesh, as to deceive the unwary observer; yet is there but one Heart, triangular, and fleshy; the other two are only the auricles, yet of the same shape and body..... If you hurt them on shore, as they lie on their backs, the teares will trickle from their Eyes.....

Grew, pp. 38 f., listed a "sea-tortoise" and commented:

.....in Generation, the embraces of the Male

and Female continue for a whole Lunary month
 They take them, by turning them on
 their Backs with staves.....as they lie on
 their Backs, they will sometimes fetch deep
 sighs, and shed abundance of Tears.

Concerning the "Heart of a Sea-Tortoise", Grew
 commented:

Herein both the single Ventricle, and
 two Auricles, are all plainly visible. The
 Hearts of all great Animals, saith Aristotle
 (part anim 1.2 c.4) have three Ventricles;
 of lesser, two; of all, at least one. One
 would a little wonder, how so observing a
 man, should discover so many mistakes, in so
 few words.

UNICORN.

The Society's famous unicorn horn-spider
 experiment was described thus by the Journal Book:
 on June 5, 1661; "The Duke of Buckingham promised
 to bring into the Society a piece of a Unicornes
 horne," and on the following July 24, "a Circle was
 made with powder of Unicornes Horne, and a Spider
 set in the middle of it; but it immediately run
 out, severall times repeated the Spyder once made
 some stay upon the powder". (Sprat, p. 223, speaks
 of an experiment, which he did not date but which
 apparently was the same, ".....of a Spider's not
 being enchanted by a Circle of Unicorn's Horn, or

Irish Earth, laid round about it".) On May 14, 1662, B, "Mr. Southwell produced a great horn, said to be an unicorn's," and on October 14, 1663, B, Boyle "mentioned, that a person had made a horn to grow on the forehead of a horse". On October 21, 1663, B,

Mr. Colwall presented the society with the answer to some of the inquiries formerly sent by him to the East-Indies..... Rhino-ceros-horn is esteemed antidotal..... If the horn be good, and any filthy or venomous liquor be put in it, you will perceive the water to bubble up with a gentle susurration.....

On May 31, 1665, B, "Col. Long remarked, that he had seen.....an unicorn's head, answering the description of it in Caesar's commentaries....." On October 22, 1668, B, "Mr. Oldenburg produced the papers.....written by Father Jerom Lobo" concerning the river Nile, the "real existence and the place of abode of the unicorn," and the "Abyssine emperor, vulgarly called Prester John....." A book on fossils by "D. Friderico Lachmund", T, 11/20/71, mentioned "fossil Unicorn and Ivory, commonly hard without, but within soft and friable, sticking close to the tongue, and of a pleasing sent," and Nathaniel Hodges in a book on the plague, T, 3/25/72, according to the reviewer esteemed bezoar and ali-

corn "of greater price than vertue". "Edw. Brown, M.D.", in an account of "several Travels through a great part of Germany", T, 12/14/76, wrote of "so great a number of Unicorns-horns (horns of a Sea-animal,) as that a magnificent Throne was built out of them in Denmark; of some of those horns, of 10, and of others, of 15 foot long....." On January 17, 1678, B,

.....the president (Sir Joseph Williamson) presented the Society with a curious horn, commonly called an unicorn's horn, being very intire and in length almost eight feet, wreathed and tapered to a sharp point. It was at the greater end hollow like an elephant's tooth for about seven inches..... It had eight wreaths in the length, and was not perfectly strait..... Its substance was pretty white, and of about the same hardness with ivory. Sir John Hoskyns mentioned.....that Olaus Wormius.....had given a description.....of the fish, out of whose snout it grows.....

On May 8, 1679, B, "Mr. Daniel Colwall presented to the Society for their repository the pizzle of an unicorn fish....." and on April 1, 1680, B, there was "discourse concerning the unicorn; and Mr. Henshaw observed, that no mention was made of it in any Latin author to have been known to the Romans".¹

1. Mr. Henshaw was wrong; see classic mention of the unicorn in discussion of that subject in Chapter Three.

Grew, p. 65, listed a "Horn of the Unicorne Bird; in Brasile called Anhima..... He feeds on Shell-fish". Grew also listed, p. 83, a "Sea-Unicorne horn, "eight feet long", which he refused to call a tooth, "in that, it performeth not the office of a Tooth, but of a Horn.....it hath, saith Bartholine, been very successfully used by Physitians in Malignant Fevers". On May 4, 1692, J, "Mr. Henshaw..... observed that the Horn Comonly Called unicorn's Horn grows in the upper Jaw of a certain Whale". On May 11, 1692, J, "Mr. Henshaw observed that the Shavings of Unicorns horn is Reported to be a present Remedy for a Tertian Ague, and is used for that purpose in Denmark....." and the next week, J, Mr. Henshaw "said that Olaus Wormius writes that Unicorns horn has about twice or double the Virtue of Hartshorn in all medicinal uses". On June 28, 1693, J, "others supposed that Elephants Teeth, Hippopotamus's Teeth, Unicornes horn, Boars and Musk Deers Tusks were all of the Nature of Teeth. But that the Rhinoceros's was of the Nature of Hornes....." Samuel Dale in a book on pharmacology, according to the reviewer, T, 10/93, concerning the rhinoceros was "of Opinion, that he is the only Unicorn to be

found among Quadrupedes, and perhaps may be the true Unicorn of the Ancients....." The reviewer of Sibbald's book about the whales off Scotland, T, 11/93, declared that Sibbald wrote nothing about the kind of whale "which has but one Tooth, and is taken for the Unicorn", but that he did propose experimentation with the "Teeth" of spermaceti whales "in those cases, where the Horn of the Sea-Unicorn is so much commended....."

UROGALLUS.

The urogallus or capercailze or cock-of-the-wood is a kind of grouse. Several legends grew up about him. On May 19, 1670, B,

Dr. Croune produced.....a written paper sent him.....from Breslau, containing an account of a cure performed on a diseased eye by means of the aqueous humour of an urogallus.....thought possible to be performed by the same humour of other birds.

On February 20, 1671, T, in a review of the book Miscellanea Curiosa Medico-Physica by German philosophers, was

.....a description of a remedy for an atrophy of the Eye, lighted upon by chance, when the Eye of an Uro-gallus.....being dissected,

the Aqueous humour, by a deep incision thereof, did spirt into the Eye of the Operator, who there-upon found the Pains of his Eye, which was much dried and did smart by over-much lucubrations, asswaged, and his sight improved.....

VEGETABLE LAMB.

A small, hairy, animal-like object was placed before the Royal Society, and it was described in "Phil. Trans.", December, 1698, thus:

.....the figure represents what is commonly, but falsely, in India, called the 'Tartarian Lamb'
 This was more than a foot long, as big as one's wrist, having seven protuberances, and toward the end some foot-stalks about three or four inches long, exactly like the foot-stalks of ferns..... It seemed to be shaped by art to imitate a lamb, the roots or climbing parts being made to resemble the body, and the extant foot-stalks the legs..... 1

VIPER.

The Society considered several viper facts and fancies in the seventeenth century, devoting much attention to a literary debate between the Italian, Francisco Redi, of spontaneous generation fame, and

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1. Henry Lee (op. cit., passim) says that the object which the Society thus received and described as a root of a fern of the genus Dicksonia, was "shaped by Chinese to represent a tan-coloured dog".

and the Frenchman, Moyse Charas, director of the Royal Garden of Plants of Paris. Redi maintained that viper venom was contained in a "yellow liquor"; Charas argued that its effect depended upon "spirits" which had to be roused by angering the viper. Unfortunately, only a few of the lively arguments - couched, of course, in the lovely cool courteous language of the time - can be presented here.

On May 8, 1661, B, there was discussion of "the production of young vipers from the powder of the liver and lungs of vipers". On June 26, 1661, B, "Mr. Rooke was requested to speak to Mr. Pellin, to procure two pots of powder of vipers, the one of whole vipers, and the other of only the hearts and livers of vipers" On July 3, 1661, B, Mr. Croune was requested to "procure, against the next meeting, some fresh vipers; and the operator to provide fresh hazle-sticks" and the following week "Mr. Croune produced the vipers, and the operator the fresh hazel-sticks.....the experiment was tried, but failed....." ¹ On June 24, 1663, B,

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1. The writer has been unable to find out what this experiment was. European hazel was thought to have various magical properties, including the ability to locate witches, water and gold.

.....the pot of viper-powder, kept by Mr. Pulleyn, was opened; but nothing alive was found in it. Mr. Hooke was desired to look upon some of the powder through a microscope, Mr. Pell relating, that Sir Charles Cavendish had kept a box of viper-powder, which being opened and found extremely stinking, had store of little moving creatures in it, like mites of cheese.....

On October 26, 1664, B,

Mr. Povey affirmed, that a gentleman of his acquaintance was by the bite of an English viper in the hand, after about a twelvemonth's time, killed.....a continued chilness seized on that hand and arm.....and on a time washing his hand in cold water, it struck such a chilness on the part, as killed him.

A week later, B, "there was also read Mr. Hooke's fuller account of the teeth of a viper seen thro' the microscope transparent and hollow....." On March 8, 1665, B,

Mr. Haak related, that he had put some young live vipers into a bottle with Malaga wine, which, though not full at first, became full after a while; whereupon untying the string of the stopper, the cork burst out against the ceiling of the room, three of the vipers following after it; the rest he kept still in the bottle unconsumed.

On February 12, 1666, T, occurred the first official Society reference to Redi's book about vipers, in which, said the reviewer,

.....he hath observed, that the poyson of Vipers is neither in their Teeth, nor in their Tayle, nor in their Galls, but in the two Vesicles or Bladders, which cover their teeth, and which coming to be compressed, when the Vipers bite, do emit a certain Yellowish Liquor, that runs along the teeth and poysons the wound. Whereof he gives this proof, that he hath rubb'd the wounds of many Animals with the Gall of Vipers, and pricked them with their Teeth, and yet no considerable ill accident followed upon it, but that as often as he rubbed the wounds with the said yellow Liquor, not one of them escaped..... He denies, what Aristotile assures.....that the spittle of a Fasting Person kills Vipers, and he laughs at many other particulars, that have been delivered concerning the Antipathy of Vipers unto certain things; and their manner of Conception and Generation, and several other properties, commonly ascribed to them.....

Sprat, p. 242, mentioned "observations.....of young Vipers, that they do not eat holes through their old ones Bellies, as is commonly affirm'd". On October 17, 1669, T, Charas' book on theriac was reviewed, and the Frenchman was said to have been of opinion

.....that commonly there are committed many faults in preparing the Ingredients of which Theriac is made up. E.g. When the Vipers are prepared, the custom is to whip them; thereby to make all the venom go to the head, which is cut off when they are sufficiently enraged. They also boile the flesh, thereby to draw forth what venemousness may yet rest therein, and their bones are cast away as useless. Whereas he saith, that it being by Experience evident, that all the venom of the Viper is in his Teeth and Jaws, that whipping is not only to no purpose, but also dangerous, in regard to the Spirits being chafed and irritated may beget venom in the body, where was none.

On November 25, 1669, B, Oldenburg gave an account of Charas' book in which the Frenchman

.....endeavours to confute Signor Redi, who had asserted.....that the poison of vipers resides in the yellow liquor contained in the bag.....about the teeth, Mons. Charas maintaining it to be in the veins and enraged spirits of the animal.....that he very much recommends the volatile salt of vipers, as the best antidote against their bitings..... The Bishop of Chester took notice hereupon, that the society had formerly made several trials of this kind, to find, whether the bitings of vipers would kill; but found, that they did not, and only made the part, that was bitten, to swell.....and he thought vipers killed no more than bees.....

Redi returned to the fray a year later, 12/12/70, T, with a letter in which he affirmed that he had made the trials again and was "thereby altogether confirmed" in what he had decided before, concerning "the seat of the Vipers poyson: concluding with more assurance than ever, that the Venom of the Italian Vipers doth not consist in an imaginary Idea of revengefull Choller, but in that yellow liquor..... whence he thinks, it would be useful, that the Learn'd Authors of the French Experiments did make new Observations....." Redi added that if new French experiments should agree with the old, then there might thus be discovered something "hitherto

unknown, viz. That the Venom of the French Vipers consists in a cholerick and vindicative idea of the Fancy; but that of the Italian, hath its seat in that yellow juice so often spoken of....." He produced new experiments, including one in which viper venom was stored for a month, became "dry and friable," and still, when inserted into wounds made in chickens, killed them. On November 20, 1671, T, a "Monsieur Bourdelot" supposed that the Redi-Charas difference might be accounted for by the theory that in hot countries like Italy viper venom could "work alone", whereas in "colder parts" like France the "said juice" might not be strong enough and would have to be "made keen by the bilious breath of the angred Viper". On May 20, 1672, T, Charas returned to the combat with a book describing new experiments made "in the presence of two or three hundred persons, Physicians and others, capable to judge, and of great veracity", which gave him "abundant cause to adhere to the result he had made from his former tryals, viz. That never any one Animal of all those, he wounded, died of the yellow liquor let into the wounds....." Charas concluded that

Signor Redi would do well, if, for the satisfaction of the Publick, without standing up any longer for the venomousness of the Jellow (sic)

juice.....he would take the pains to look after some other thing, that might be common to the Vipers of France and Italy.....and deserve to be equally declared to be the true seat of their Venom; that so Signor Redi might as validly exclude from it the enraged Spirits, as he (Charas) now does the Jellow liquor: But if he can find none such, our Author thinks, he can have no ground to maintain his opinion or contend against that of the vexed Spirits any longer.

Redi did not vex the spirits of Charas, or vice versa, any more in the Society's seventeenth century transactions, but their combat was carried on by others. On October 14, 1672, T, a letter from Thomas Platt, in Florence, spoke of a discussion there "concerning the validity of Sinnor Redi's Assertion" and some experiments which bore that assertion out, as well as disproved the old legend that to swallow a viper's head was a preservative against a viper bite - the Florentines made a cock swallow a viper's head, then made a live viper bite it, and watched the rooster die "within a quarter of an hour". Grew, p. 254, said that he had not seen it himself, "yet I have been told.....that the Volatile Salt of Vipers, will figure itself into the semblance of little Vipers". On June 9, 1692, "Mr. Henshaw related that Souldier that was overgrown with Leprosy was cured by Drinking the Blood of Vipers," and on July 14, 1692, J, "it was further concluded that the

Common opinion of the young ones (of adders) again Creeping into the Belly by the Mouth was a fiction...."

On May 2, 1694, J, Mr. Henshaw opined that the Redi-Charas controversy might be resolved by the theory that the quantity of poison "Evacuated by an Enrag'd Viper" might be greater than that which would ordinarily be found in the "Gumms of a Dead Viper, for which reason it was likely the Venom of the Enraged was found by Charas to be so much the Greater....." At the same meeting "Another Paper was read concerning the Method of making Viper Wine by putting them alive into a Cask of Wine, and letting them long infuse therein. The virtues of this wine are reported incredibly great in almost all Cases". In January 1700, T, Sir Theodore de Mayerne in a "Discourse of the Viper" declared it to be "observable, that the perspiration being obstructed by the Poyson, a man bit by a Viper, and swell'd up, in three or four days shall weigh almost as much more as he did before....."

VIRGULA DIVINA.

On May 6, 1663, B,

The Virgula divina was tried, but by unlucky hands. It was ordered to be tried again with

shoots of one year's growth, and after Gabriel Platt's method, tying the end of the hazel to a staff in the middle with a strong thread, so that it hang even, like the beam of a balance.

The reviewer of Kircher's Mundus Subterraneus, T, 11/6/65, said that the author spoke of the "vanity of Virga Divinatoria," and on October 21, 1667, T, Glanvill reported an answer to a mine query by "a person living near the Mendip-Mines" who said that the virgula "hath not been known to have been used in these partsthere are no certain signes above ground, that afoord any probability of a Mine, to my knowledge....." On September 21, 1668, T, Glanvill reported that some Mendip miners had tried the virgula, "but the Experienced Workmen have no value for it....." On May 26, 1670, B, Dr. Edward Brown in a letter reported that the virgula was used in the "Prince of Heaven" silver mine near Prague.

WATER.

The Society took a practical interest in the ability of divers to stay under water. On February 4, 1663, B, "Dr. Merret related a story of a caulkker, who managed his breath so well under water, as to stay half

an hour under it to repair a foundered ship....." ¹

On March 16, 1664, B, Sir Robert Moray reported that he had been informed by the French Ambassador "that there was at that time a diver at Dieppe able to stay one or two hours, and longer, under water.....using a headpiece wide only about the mouth, and a suit of leather well stopped and tied about him". Sir Robert suspected that this diver "might use a piece of sponge dipt in oil, and hold it in his mouth". He was "desired to inquire farther into this matter....." On March 22, 1665, B, "there were two experiments made for the finding out a way to breath under water, useful for divers". The first consisted of putting a bird into the "rarefying engine, and with it a glass-bottle with distilled vinegar and pounded oister-shells, which, whilst the vinegar is dissolving them, affords a steamsupposed to be a kind of new air....." The bird died. The second experiment involved a "kitling" in place of the bird and aquafortis in place of vinegar. ".....the animal appeared dying.....taken out into the

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1. The Experimental Diving Unit at the Naval Gun Factory, Washington, D.C., states that men after forced breathing have held their breath 260 seconds, and drowned persons can be resuscitated after a maximum of ten minutes. Destruction of certain brain cells begins after seven minutes of anoxia.

open air.....it revived again....." On January 11, 1669, T, Sir Philberto Vernatti reported that Batavian pearl divers stayed under water "about a quarter of an hour". On January 25, 1672, B, "Dr. Hierne F.R.S." reported that there was in Paris a man who revived drowned creatures by drawing them gently from the water and putting ashes over the body, and ".....Mons. Ox-huwen, a Swedish gentleman, assured me, that some years ago.....a youth.....fell into the water.....whence he was not drawn up till the third day after, and was recovered after the manner above described....." On December 3, 1690, T, Sir Robert Southwell declared that "it was reported that the Dyvers for Sponges were not permitted to marry til they could tarry $\frac{3}{4}$ of an hour under Water, the truth of which he much questioned...."

WEREWOLF.

On September 2, 1663, B,

Sir Kenelme read a letter, sent to him out of the Palatinate, concerning some children snatched away in those parts by beasts, that had all the appearance of wolves; but found killed after so strange a manner, that all people thereabout surmised, that they were not wolves, but lycanthropi, seeing, that nothing of the bodies of those children were devoured, but the heads, arms, and legs, severed from their bodies, the skulls opened, and the brains taken out and scattered about the car-

cases, and the hearts and bowels, in like manner pulled out, but not devoured. The society judged, that the truth of the matter of fact ought to be well attested, before any thing be pronounced of it.....

WHALE.

A review of a book about the "Feroe" islands by Lucas Debes, T, 11/22/75, said the author described "the Roar and Witch-Whale", how they could be sunk by castoreum (q.v. supra, under "Beaver", Chapter Three), and Sibbald's book about the whales off Scotland, T, 11/93,

.....observes, that they all have a great Love for their Young, carrying them.....under their Lateral Fins, and following them when they are bigger; which he thinks may have given the occasion of that Fable of the Fish that guides the Whale.....

WOODPECKER.

In December, 1693, T, John Clayton wrote from Virginia,

.....there's a tradition among them (the Virginians), that the tongue of one of these Wood-peckers dried will make the Teeth drop out if pick'd therewith, and cure the Tooth-ach (tho' I believe little of it, but look on it ridiculous).....

WORM.

On July 17, 1661, B, Mr. Croune was "desired to keep the slow-worm, in order to see, whether the young one would eat through its belly....." On May 7, 1668, B, it was ordered that a slow-worm be put in the rarefying engine and then made to bite a dog or kitten "to which afterwards the stone, called pietra di covreshould be applied....." Neither of these experiments was further reported.

YEW

On July 27, 1664, B, Boyle stated that yew trees were "mischievous" to horses, "there having been three horses tied to such a tree at the Wells, which eating of its leaves, two of them died within a few hours after, and the third recovered with much difficulty....." and Dr. Wallis agreed that the "leaves of the said tree being mingled with meat" would kill dogs. On July 8, 1680, B, Mr. Houghton "affirmed, that he had notwithstanding divers times eat the berries of it without harm".

CHAPTER VII.THE FABLES IN LITERATURE AFTER 1600.

Although the early scientists discredited most nature fables, the seventeenth century writers managed to salvage a few. Most of these survivors came down as unbelieved-in literary devices, however. In that troubled time faith ebbed fast, and with it ebbed belief in the old stories which had for so long been as real to men as sunrise or the Trinity. Many of those writers were scientists as well; most of them were extremely interested in the progress of science, and nearly all of them discarded pseudodoxia naturalis in great chunks. The process began soon after the death of Elizabeth.

John Donne well exemplifies the sceptical spirit in which those learned, subtle and passionate men remarked the impact of the new knowledge on the old traditions. His notable "Get with child a mandrake root" serves admirably to illustrate his general attitude toward the fables. As a sharp observer of the "new Philosophy" - his Ignatius His Conclave, written in 1611, refers to Kepler, who was then an all but unknown beginner -

he was well aware of attacks on the credibility of the fables, but as an artist he refused to deprive himself of their services. He made use of man-drake, basilisk, mermaid, phoenix, swan, chimera, salamander, giant and various monsters when they suited his poetic needs - but usually with liberal sprinkling of metaphysical salt. In "Elegy IV" he accuses his sweetheart's "hydroptic father" of searching for him "with glazed eyes,/ As though he came to kill a cockatrice". In "Elegy XIX" he begins by remarking that "Love is a bear-whelp; if we o'er lick.....We err, and of a lump a monster make," and later, describing the topography of his beloved, states that from her lips, "Not faint Canaries, but ambrosial," come "Siren's songs and there/ Wise Delphic oracles do fill the ear". In the little verse letter to "Mr. S(amuel) B(rooke)" he says, "I sing not, siren-like, to tempt, for I/ Am harsh....." (When he wishes to be less harsh he uses the mermaid-type of siren; cf. "Go and catch a falling star.....Teach me to hear mermaids singing,/ Or to keep off envy's stinging.....") In "Satire III", wherein his spleen was not entirely "choked" by "kind pity", he says that the

"frozen North" voyagers are "thrice colder than salamanders....." In almost every reference to unnatural natural history Donne is faintly or openly derisive. There is the notable exception in "First Anniversary": "And all the world would be one dying swan,/ To sing her funeral praise, and vanish then." Typical of Donne's general attitude toward the vanishing fables of his time were his "Commendatory Verses" to that "great lunatic" Thomas Coryat's "talk of Will Conqueror, and Prester Jack," and his discussion of the phoenix "Riddle" in "Devotions Upon Emergent Occasions": "..... there is no Phenix; nothing singular....." ¹

Ben Jonson with his classical humour made more use of dryads and nymphs and other such Hellenic companions than of their uglier northern cousins. Sir Walter Raleigh discussed tree-born oysters and giants and hybrids and a fair field full of nymphs and so forth. That great eo-scientist Francis Bacon, turning the searchlight of his attention onto the field of natural history, declared in "The Proficiency and Advancement of

1. 'Tis pity that there is not in this thesis space to discuss Prester John, The Old Man of the Sea, The Wandering Jew and other such singular persons.

Learning" that therein

.....there hath not been that choice and judgment used as ought to have been; as may appear in the writings of Plinius, Cardanus, Albertus, and divers of the Arabians..... Wherein the wisdom and integrity of Aristotle is worthy to be observed.....

but in his works he mentioned Pliny, not always disrespectfully, twenty-five times, and he wrote seriously of several fables, as noted in Chapter Five.

Contemporary with these was Robert Burton, who thought little of science and less of the seventeenth century:

Our whole life is an Irish sea, wherein there is nought to be expected, but tempestuous storms, and troublesome waves,no Halcyonian times, wherein a man can hold himself secure.....betwixt hope and fears, suspicions, angers.....betwixt falling in, falling out, &c. we bangle away our best dayes, befool out our times, we lead a contentious, discontent, tumultuous, melancholy, miserable life..... 1

He preferred the past, as found in books. Burton was rather like Pliny, whom he affectionately called "Unkle Pliny",² in his tastes. He liked to

1. The Anatomy of Melancholy, I, 157.

2. Ibid., II, 557.

philosophize, to moralize and to illustrate - from Authority. His mind ranged farther than Pliny's. In his discussion of "Ayr rectified" he betrays a quite Browne-like amplitude of curiosity:

As a long-winged hawk.....mounts aloft, and for his pleasure fetcheth many a circuit in the ayr.....so will I.....a while rove, wander round about the worldin which progress, I will.....see what should be the true cause of the variation of the compass..... Whether the sea be open.....by the pole arctick.....whetherPresbyter John be in Asia or Africkwhether there be any such great city of Mannoia or Eldorado.....what becomes of swallows, storks, cranes, cuckows, nightingales, redstarts, and many other kinde of singing birds.....some.....only seen in summer, some in winter.....whether.....if God did not detain it, the sea would over-flow the earth by reason of his higher site..... I would examine the true seat of that terrestrial Paradise, and where Ophir was..... I would censure all Pliny's, Solinus, Strabo's, Sr. John Mandevill's, Olaus Magnus, Marcus Polus lyes..... 1

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1. Ibid., I, 365 ff. Burton was not irrevocably opposed to the "lyes" of "Unkle Pliny" and Company, however. In the same passage he says, "As I go by Madagascar, I would see that great bird Rucke, that can carry a man and horse or an elephant, with the Arabian Pheonixthe pellicans of Aegypt, those Scythian gryphes in Asia....." The Anatomist continues this spirited journey with inquiries as to what God did before He made the world: "..... was he idle? where did he hide?" and whether He is infinitely good - if so, "if he pull it (the world) down because evil, how shall he be /

In body, however, Burton ranged less far than Pliny. His "roving" was almost all confined to the library, wherein he was a more voracious devourer of other men's works than even Pliny had been. Which is not to say that he was more diligent at reading than his Unkle - that, according to Pliny the Younger, would have been impossible - it is rather to say that in Burton's time there were more books available. He had access to many of the ones which Pliny mined, and a great many more that had come along since. Pliny modestly acknowledged his debt to one hundred authors. Robert Burton must have read through, noting as he read, a thousand. His attitude toward nature fables was almost identical to Pliny's. He liked them; he liked to pass them on; he had no desire to put them to the test. In the Anatomy he referred to fifty-three

1. (contd.)

be free from the evil, that made it evil?" and "many such absurd and brain-sick questions, froth of human wit, and excrements of curiosity," until finally, after twenty-five pages, he exclaims, "But hoo! I am now gone quite out of sight: I am almost giddy with raving", and turns back to his melancholy muttons.

major pseudodoxia naturalis. In no case which has come to this writer's attention did he speak of personal investigation.¹

In general, Burton's references to nature fables are merely quotations from Authority, differing from Pliny's only by the inclusion of the post-Plinian Authority, most of it Pliny-based, of the intervening fifteen hundred years. A random sampling will adequately illustrate. Concerning antipathies and sympathies, Burton writes:

In vegetall creatures what sovereignty Love hath, by many pregnant proofs and familiar examples may be proved, especially of palm trees, which are both he and she, and express not a sympathy but a love-passion, as by many observations hath been confirmed..... Constantine de Agric. lib. 10, cap. 4. gives an instance out of Florentius his Georgicks, of a palm tree that loved most fervently, and would not be comforted untill such time her love applied himself unto her..... Ammianus Marcellinus lib. 24, reports that they marry one another. 2

Of mermaids, he says:

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1. The writer would be grateful for any correction of this surmise. He read through The Anatomy paragraph by paragraph, not comma by comma.
 2. Ibid., II, 193. Burton closes this authoritative dissertation on phoiniphilia by citing yet another authority: "If any man think this which I say, to be a tale, let him read..... Jovianus Pontanus....."

Water-divels are those naiades or water nymphs which have been heretofore conversant about waters and rivers. The water (as Paracelsus thinks) is their chaos, wherein they live..... These cause inundations, many times shipwracks, and deceive men divers wayes, as Succubae, or otherwise, appearing most part (saith Trithemius) in womens shapes. Paracelsus hath severall stories of them that have.....been marryed to mortal men, and.....have forsaken themand Hector Boethius, of Macbeth and Banco, two Scottish lords, that.....had their fortunes told them by three strange women. To these heretofore they did use to sacrifice, by that.....divination by waters. 1

The phoenix he mentions many times, usually nostalgically, as in a wistful little quotation from Philostratos:

.....the rain is a stranger to the earth, rivers to the sea, Jupiter in Egypt, the sun to us all. The soule is an alien to the body, a nightingale to the ayr, a swallow in an house, and Ganymede in heaven, an elephant in Rome, a phoenix in India..... 2

Burton was wise in the ways of the sick mind, however, and described lycanthropy, "or woolf-madness, when men run howling about graves and fields in the night, and will not be perswaded but that they are

1. Ibid., I, 67.

2. Ibid., II, 52. Burton concludes: "and such things commonly please us best, which are most strange, and come farthest off."

wolves or some such beasts," as a mental aberration and not a reality.¹ He clung to the fables not from ignorance but because he preferred the old world they came from.

If Bacon represented the forward-looking man of science and Burton the backward-looking man of books, then somewhere in between we must place Sir Thomas Browne, the "great Amphibian" who moved freely in future and in past. He was inquisitive - but much of his questioning was confined to dusty old matters found in books. Like Burton he roved through the past, and, like Bacon, he applied to what he found there the method of the future, the question. Indeed, he often surpassed Bacon in his "futurity". Whereas Sir Francis had contented himself with indicating what experiments should be made, Sir Thomas often made them. Regarding "a peremptory adhesion unto authority" as the "mortallest enemy unto knowledge",² his ques-

1. Ibid., I, 13. Sir William Osler said that The Anatomy was the best medical book ever written by a layman.
2. Browne, Works, Pseudo., II, 214. It is amusing to observe that in the next paragraph Browne justifies this attack on Authority by an appeal to Authority: "Thus Hippocrates.....conceived it no injustice either to examine or to refute the doctrines of his predecessors; Galen the like, and Aristotle the most of any." - Ibid., 215.

tioning ranged all the way up to the edge of the divine.¹ In natural history, he saw fit to be curious about more than one hundred fables. Of those he wrote of, he branded false some forty, dubious another fifteen, and possible four more. Nineteen of them he accounted true. The others, approximately thirty, he passed on without critical comment. He spoke of personal experiment in more than a score of instances. To see whether the "death-watch" beetle presaged death he put some in "thin boxes, wherein I have heard and seen them work and knock with a little proboscis.....against the side of the box," and concluded that the superstitious should "extinguish the terrifying apprehensions hereof.....prevent the passions of the heart, and many cold sweats in grandmothers and nurses"² To ascertain the truth of the old legend that "the horse hath no gall" he dissected one and found the story "repugnant unto experience" as well

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1. "In philosophy, where truth seems double-faced, there is no man more paradoxical than myself; but in divinity, I love to keep the road....."
Ibid., Rel. Med., II, 9.
 2. Ibid., Pseudo., II, 37f f.

as well as reason.¹ To see whether a kingfisher suspended by a thread turns towards the wind, he "hanged up" one on a strand of "untwisted silk, in an open room," and noted that it did but seldom breast the wind.² He kept vipers in an attempt to find out if their young gnawed their way out of the mothers, but that experiment "hath not well succeeded; for though we fed them with milk, bran, cheese, &c. the females always died before the young ones were mature for this eruption....." ³ Of the old notion that moles have no eyes he was impatient in the manner of the practical man: "..... that they have eyes in their head, is manifested unto any that wants them not in his own....." ⁴ He tested peacock flesh for immortality and decided that it was indeed incorruptible.⁵ To make proof the supposed antipathy between toad and spider, he put a toad and "several spiders" in a glass, and

1. Ibid., 396.

2. Ibid., 432.

3. Ibid., 461. Thus foiled of opportunity for personal observation, Sir Thomas fell back on authority which had concluded that the fable was very probably fabulous.

4. Ibid., 473.

5. Ibid., 520. Augustine made the same mistake. Both he and Browne terminated the experiment too soon.

"beheld the spiders, without resistance to sit upon his head and pass all over his body; but at last upon advantage he swallowed.....unto the number of seven".¹ To satisfy himself that contrary to the "common expression" snakes have no venom in their tails, he looked at them, and "could never find it".² The fables which Browne did not attack were usually protected by the Bible, as the basilisk and the unicorn, or by lack of specific information unobtainable in his time, as sun-blackening and spontaneous generation. But he was nearly always guarded in his approval. His fabulous creatures were not so very fabulous.³ Rarely was he led

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1. Ibid., 524 f. Christopher Wren's father, commenting on this experiment in a marginal note, termed it "remarkable" and decided that from it "wee maye conclude against the old deception". - Ibid., 525.
 2. Ibid., 535.
 3. Of the basilisk, he said: ".....that such an animal there is, if we evade not the testimony of Scripture and human writers, we cannot safely deny..... But the basilisk of elder times was a proper kind of serpent....." Of the unicorn: ".....we are so far from denying there is any unicorn at all, that we affirm there are.....of quadrupeds.....no less than five..... Some in the list of fishes.....and some.....even among insects....." - Ibid., II, 413 ff., 498. For "my own curiosity" Browne made some fake basilisks out of fishes. Ibid., 416. He said that even if one had "the unicorn's horn" its supposed virtues might be questioned, /

astray by authority.¹ His influence, like that of the Royal Society, which for some reason - geography? - he never joined, was almost entirely inimical to pseudodoxia naturalis.

Although the seventeenth century attacks on the nature fables had a crushing effect, they did not succeed in banishing all the yellow-skirted fays, however. The less picturesque errors, such as the jointless-elephant and fish-flesh beaver and stinging lizard, began to drop out of belief, but the others, the old faithfuls, hung on. Their credibility was damaged but their value as symbols remained.

Bunyan found use for only one fable in

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1. Notable exception: for lack of better authority, on the authority of "Jacobus Bontius late physician at Java" he inclined toward the view that the tiger is not swift, but a "slow and tardigradous animal, preying upon advantage, and otherwise may be escaped". - Ibid., II, 537.
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3. (contd.)
questioned, "For.....none of the ancients ascribed any medicinal or antidotal virtue unto" it. - Ibid., 502. Concerning the unicorn's appearance, he declared: "We are unwilling to question the royal supporters of England, that is, the approved descriptions of the lion and the unicorn....." - Ibid., III, 145.

The Pilgrim's Progress. (Prudence explains to Matthew why the pelican by piercing her breast represents Christ.) But Butler demonstrated a lively affection for several in Hudibras, and his contemporaries did likewise.

Milton was like Donne in his attitude toward nature fables. He knew very well that most of them were doubtful or false, but he did not hesitate to refer to them when it suited his artistic purposes. Altogether, in his poetry he mentioned some sixty fables some one hundred and twenty times. Milton was partial to dragons, giants and magic wands - he used them nine, seven and six times respectively - but he did not neglect their fabulous kin. He even revived some old Plinian favourites, like cerastes and dipsas and ellops, that had been drifting into oblivion.¹ He knew well how to extract the last ounce of picturesque evocativeness from the fables. When Comus enters with his

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1. In Paradise Lost, X, 523 ff, Satan's crew are transformed into "complicated monsters..... Scorpion and Asp, and Amphisbaena dire,/ Cerastes horn'd, Hydrus, and Ellops drear,/ And Dipsas....." These were Plinian serpent-like creatures.

"Charming Rod" he meets "pert Fairies.....dapper
 Elves.....Wood-Nymphs deck't with Daisies trim" and
 calls for revels proper to that time "when the Dra-
 gon woom of Stygian darknes spets her thickest
 gloom" as the lost brothers seek Echo

.....in the violet imbroider'd vale
 Where the love-lorn Nightingale
 Nightly to thee her sad Song mourneth well.¹

Never has the halcyon worked her magic more beauti-
 fully than on that night

Wherein the Prince of light
 His raign of peace upon the earth began:
 The Windes with wonder whist,
 Smoothly the waters kist,
 Whispering new joyes to the milde Ocean,
 Who now hath quite forgot to rave,
 While Birds of Calm sit brooding on the charmed
 wave. 2

No goblin has ever been more gnomish than the "swart
 faery of the mine", no Fastitocolon vaster than
 Leviathan, "Hugest of living Creatures," stretched
 "like a Promontory.....a moving land," no serpent
 more frightening than that "subtl'st Beast of all
 the field", huge, "with brazen Eyes/ And hairy Main

1. Comus, passim.

2. "On the Morning of Christ's Nativity", II,
 62 ff.

Look homeward Angel now, and melt with ruth.
 And, O ye Dolphins, waft the hapless youth.
 Weep no more, woful Shepherds weep no more..... 1

Like a master craftsman he used the fables to produce effects impossible to achieve otherwise. In Paradise Regained, Book II, when Satan offers Christ the most tempting of foods on a "Table richly spread" and Christ refuses them - "Thy pompous Delicacies I contemn" - the great "malecontent" bursts out in rage, and

.....with that
 Both Table and Provision vanish'd quite
 With sound of Harpies wings and Talons heard.....

Indeed, Milton stated clearly his principle:

.....'tis not vain or fabulous.....
 What the sage Poëts.....
 Storied of old in high immortal vers
 Of dire Chimera's and enchanted Iles,
 And rifted Rocks whose entrance leads to hell,
 For such there be, but unbelief is blind. 2

Milton's contemporaries and successors made far less use of the fables than did he. Dryden, a member of the Royal Society, in his poems made about sixty-five references to about forty-five

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1. "Lycidas", II, 163 ff.
 2. Spirit to Brothers, "Comus", II, 512 ff.

fables. His favourites were the phoenix, which he mentioned six times, and monsters, dragons and hydras, which he referred to three times each. Most of his references were in the classic mode - thrown in merely as fashionable decorations. A typical example occurs in "Threnodia Augustalis" when he likens the return of Charles II to the time ".....when the new-born phoenix takes his way,/ His rich paternal regions to survey....." Later in the same poem he uses fairy rings in the same flat, un-magical way:

As, when in fields the fairy rounds are seen,
A rank sour herbage rises on the green;
So, springing where the midnight elves advance,
Rebellion prints the footsteps of the dance.....

Dryden even managed to involve the fables in that strange infelicity of language of which he was a little too often capable. In his "Heroic Stanzas" (on the death of Cromwell), he remarked - one could hardly say he "sang" or "cried" or "intoned"

- :

.....and wars have that respect for his repose,
As winds for halcyons when they breed at sea.....

The Poet Laureate was a master in his own field of robust, flexible verse, but he found little of value in pseudodoxia naturalis. He was too busy exposing frauds to make much use of them. He heralded the Classic Age which returned them to dry, mannered sterility.

Pope used thirty fables forty times. Dragons were his favourites. He referred to them five times. And never with the purpose of calling up, like Hotspur's spirits from the vasty deep, horror and fear. The Wasp's dragons were waspish in size and disposition. Typical were those of "The Dunciad", which glared with the Gorgons and rushed to farcical war with the "ten-horn'd fiends", and hissed. They even grimaced; of poor Booth Pope declared, ".....on grinning dragons thou shalt mount the wind....." ¹ To Pope the fables were a source of satiric symbolism, and not much of that. In his time one might have thought that the state of pseudodoxia naturalis was similar to that of the unfortunate Sir Fopling, who

A mournful glance.....upwards cast,

1. "The Dunciad", I, 443.

"Those eyes were made so killing!" - was his
last.

Thus on Marander's flowery margin lies
The expiring swan, and as he sings he dies. 1

But some of the fables were hardy.

They had proved themselves capable of surviving the coming of Christianity, and the so-called Dark Ages, and the Renaissance. They managed to weather the onslaught of science, too. Not without loss of tail-feathers, however. During the eighteenth century they fell rapidly into disuse. In 1600 nearly all the fables were known and believed. In 1700 most were still known, but doubted. By 1800 few were remembered and nearly all of those were disbelieved. Not until the Romantic movement was in full career was the stigma of "false" set aside for the accolade of "picturesque", for the fables.

Dr. Johnson's use of nature fables is typical of his period's attitude towards them. In his preface to Lobo's Voyage to Abyssinia, which he translated, the Doctor declared, "He appears to have.....consulted with his senses, not his imagination. He meets with no basilisks that destroy with their eyes, his crocodiles devour their prey

1. "The Rape of the Lock", II, 80 ff.

without tears....." Speculating on the "curious formation" of the bat, he called it a "mouse with wings" and said that it was "almost as strange a thing in physiology, as if the fabulous dragon could be seen".¹ Discussing the extravagance of Garrick's funeral, "'Were there not six horses to each coach?' said Mrs. Burney. JOHNSON. 'Madam, there were no more six horses than six phoenixes.'" ² Although, as mentioned in Chapter Three, Johnson did go astray in the matter of swallow hibernation, he neither believed in nor made use of many other fabulous bits of natural history. There is evidence that he knew most of them - in his thirtieth year he wrote to Mr. Cave: "Pray lend me Topsel (sic) on Animals" - but he seems to have regarded them with the same lenient and amused air with which he observed his friend Goldsmith's attempts to condense the field of natural history into two volumes. (Of Poor Noll's History of Earth and Animated

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1. Boswell's Life, II, 244.
 2. Ibid., 459. On another occasion, after meeting John Wilkes "'after hearing his name sounded from pole to pole, as the phoenix of conviviality,'" Johnson declared, "'we are disappointed in his company!'" - Ibid., 134.

Nature Johnson remarked that he had no doubt it would prove "as interesting as a fairy tale". - Op. cit., I, vi. Boswell and "Lusiad" Mickle once went calling on Goldsmith while he was at work on his History. "He was not at home, but having a curiosity to see his apartment, we went in, and found curious scraps of descriptions of animals, scrawled upon the wall with a black lead pencil." - Life, I, 432.)

There was a good deal of false belief floating about in the eighteenth century. In Edinburgh Lord Monboddo, Lord of Session and patron of the arts, used to hurry to every birth he heard of, in hopes of seeing a new-born child, complete with the tail which he was convinced came with it. (Monboddo's contemporary, Lord Gardenstone, also a Lord of Session, maintained a pet pig which slept in his master's clothes so as to render them nice and warm for the morning.) But the beliefs were not very poetic. The poor fables suffered their dimmallest decline. Thomson, for instance, in a work that would have summoned up scores of basilisks and dragons and sorrowing nightingales two hundred

years before, found use for only eight items of pseudodoxia naturalis in the whole range of The Seasons. When Sheridan in The Rivals dragged in a dragon, it was only as a necessary appurtenance to the noble St. George. That was a bad time for nature fables.

With the Romantics and their Gothic gloom the prospect for pseudodoxia brightened. Writers of that ruin-haunted nature-loving school found much to their taste in the rusty old legends. Shelley was too busy reforming the world and hymning its simpler beauties to dig very deep into the old mine - he referred only about a dozen times to nature fables - but Keats worked in nearly forty references to some thirty fables, and Byron had a glorious time tossing the old Plinian monsters around. He made more than one hundred and thirty references to nearly forty different items of pseudodoxia naturalis. His favourite mythical beast, as might have been expected, was Pegasus. He mentioned that animal fourteen times. Giants were next favoured, with ten references, mermaids came third with seven, and centaurs and sirens tied for fourth place with five references apiece.

Byron's real love, however, was no fabulous beast at all. It was a fabulous idea - spontaneous generation of the channering worm. He spoke eighteen times of spontaneous generation. All but three of those references were to "the worm that dieth not". And those three non-worm references all involved very slimy productions - "monsters of the deep" from slime, "reptiles engendered out of the subsiding slime of a mighty universe", and "monstrous shapes" from the Nile's "sun-sodden slime".¹ He never allowed Pegasus to stay long from the lair of the "fouler lips" of men's last company, those "lords of the grave", the worms.² Pegasus took him to the ancient dwelling-places of such old forgotten Plinian friends as Caprimulgus, and he was terribly at home in his projected

.....new creation, rising out
 From our old crash, some mystic, ancient strain
 Of things destroyed and left in airy doubt;
 Like to the notions we now entertain
 Of Titans, giants, fellows of about
 Some hundred feet in height, not to say miles,

-
1. "Childe Harold's Pilgrimage", I, 241; "Cain", II, 2; "Don Juan", VIII, lxxxii.
 2. "Lines Inscribed Upon a Cup Formed From a Skull", I, 80; "Sardanapalus", I, 579.

And mammoths, and your wingéd crocodiles. 1

But his satiric streak never entirely mastered his Romantic gloom, and although he expressed the wish to "soar with the phoenix on pinions of flame" and "with him.....expire in the blaze", he more often visualized his last resting place as that dark tomb where "still the worm winds its cold folds". 2

From the sound of his more channering poetry one would suppose that Byron could not wait to go down to his long home, the better there to suffer eternally. However, there is ample evidence to indicate that he took his fables no more seriously than he took many other things to which he paid an occasional semblance of lip-service. Indeed, on five occasions he found opportunity to append footnotes to his poems commenting on the probability or vice versa of fables he was at that point using with utmost gravity. In "The Giaour" he mournfully sings that bliss unshared is as if

.....the desert bird

-
1. "Don Juan", IX, xxxviii. Byron's "goatsucker" is a cow-sucking hedgehog. - "The Deformed Transformed", I, 1.
 2. "Lines Addressed to the Rev. J.T.Becher....."; "The Age of Bronze."

Whose beak unlocks her bosom's stream
 To still her famished nestlings' scream,
 Nor mourns a life to them transferred,
 Should rend her rash devoted breast,
 And find them flown her empty nest,

and then proceeds to remark briskly in a footnote:
 "The pelican is, I believe, the bird so libelled,
 by the imputation of feeding her chickens with her
 blood....." Again in "The Giaour" he calls up a
 horrid picture of a vampire sent to tear a corpse
 from a tomb and then "ghastly haunt thy native
 place,/ And suck the blood of all thy race", and
 notes: "The Vampire superstition is still general
 in the Levant..... I recollect a whole family be-
 ing terrified by the scream of a child, which they
 imagined must proceed from such a visitation." He
 paints the most vivid picture yet recorded of the
 self-destruction of the scorpion:

The Mind, that broods o'er guilty woes,
 Is like the Scorpion girt by fire;
 In circle narrowing as it glows,
 The flames around their captive close,
 Till inly searched by thousand throes,
 And maddened in her ire,
 One sad and sole relief she knows -
 The sting she nourished for her foes,
 Whose venom never yet was vain,
 Gives but one pang, and cures all pain,
 And darts into her desperate brain.....

and adds this footnote: "Alluding to the dubious

suicide of the scorpion, so placed for experiment by gentle philosophers....." ("The Giaour.") In the matter of the sadness of the song of the nightingale, he goes back to the old legend, referring to the poor bird "that sings with the deep thorn,/ Which fable places in her breast of Wail," ("Don Juan", VI, 87), and on various other occasions versifies piteously concerning her, but in "The Bride of Abydos", II, 283 f., he refers to the nightingale's song as only "somewhat sad," and comments below: "It has been much doubted whether the notes of this 'Lover of the rose' are sad or merry..... I dare not venture a conjecture....." Defending his metempsychosis of the soul of Zuleika into the bulbul in that same part of that poem, Byron notes: ".....For a belief that the souls of of the dead inhabit the forms of birds, we need not travel to the East," and he cites "Lord Lyttleton's ghost story, the belief of the Duchess of Kendal, that George I flew into her window in the shape of a raven, and many other instances," as bringing "this superstition nearer home". Despite his sceptical attitude towards the fables - indeed, on occasion because of it - Byron succeeded in making very effective use of them, and did much to

help to preserve the old stand-byes and revive some of their less vigorous brethren. There is a piteousness about his birds of paradise which those gentle fowl never dreamed of before, in his "Prophecy of Dante" apostrophe to ".....fierce thoughts, the thrilling sense" which, when they as

.....Birds of Paradise but long to flee
Back to their native mansions, soon they find
Earth's mist with their pure pinions not agree,
And die or are degraded; for the mind
Succumbs to long infection and despair,
And vulture Passions flying close behind,
Await the moment to assail and tear;
And when, at length, the wingéd wanderers stoop,
Then is the Prey-birds triumph, then they share
The spoil.....

Almost as vivid is that other notable modern sky-haunter memorialized by Wordsworth in his ornithological outpouring "Upon Seeing a Coloured Drawing of the Bird of Paradise in an Album":

Thou buoyant minion of the tropic air.....
Plumes that might catch, but cannot keep, or
And, with cloud-streaks lightest and loftiest,
The sun's first greeting, his last farewell ray!
Resplendent Wanderer.....mysterious Bird.....
The Bird of God! Whose blessed will
She seems performing as she flies
Over the earth and through the skies
In never-wearyed search of Paradise.....

Seeking with indefatigable quest
Above a world that deems itself most wise
When most enslaved by gross realities!

Indeed, those two widely differing treatments of the old footless-bird fable demonstrate clearly the trend in fable use that gained such momentum after 1800 and has continued since - the trend towards personal interpretation. Before science destroyed belief in the stories, they formed a corporate entity, and were used either seriously or in standard allegory. A dragon was an existent monster whose malicious doings in some identifiable land were related with horror, or he was a symbol of evil. A mediaeval writer thought of him as a flesh and blood creature of predictable if dreadful actions which could be used to represent certain accepted concepts. In the seventeenth century he was discredited as a reality, but his skin was preserved to pad out Classic rhymes. Romanticism, filling Nature with human and super-human emotions, puffed out his old skin into a score of different shapes. He was even used to mock his own unreality, and by conjunction with the presumed more solid, to make it seem less so. While Byron, for

instance, was flying all over the stormy skies on his Pegasus, Burns was at one moment angrily inveighing against "Pegasean pride," ("Epistle to Hugh Parker"); and at the next wryly remarking that "Poor slipshod giddy Pegasus/ Was but a sorry walker....." ("To John Taylor"). This trend towards personal interpretation of the fables has grown steadily. And often the writers of Victorian and later times by passionate use of a few old stories have managed to give an impression of much more nature-fabling than they actually engaged in. For along with this trend towards personal interpretation has run a trend towards diminution of number of fables so utilized. The Elizabethans referred to more than a hundred different bits of pseudodoxia naturalis; the Victorians and the moderns confine themselves to a score or less. And this they do not always from choice, but because outside that small compass of fables, which live only by virtue of sophistication, all the others are not only dead but buried. Reference to them would either puzzle the average reader or go over his head entirely. It is remarkable how much mileage the more modern writers have got out of the few

fables left to them. Burns referred a dozen times to eleven nature fables, yet because most of his fables involved non-fabulous beasts such as eagle and nightingale and owl and scorpion and toad, his poetry, outside the sorcery tales involving warlocks and cantraips and witches and Auld Nick, that "towzie tyke, black, grim, an' large" of "Tam O'-Shanter", gives an impression of much less fabulousness than does that of Kipling, who in his much larger volume of work referred only four more times to four more fables - because those fables featured romantic non-beings such as amazon and basilisk and centaur and the phoenix. Even that slipper-in-and-out of the Celtic twilight, Yeats, used relatively few fables - thirty seven references to eighteen false beliefs - to create his atmosphere of mist and dream and un-naturalness. He used eight dragons; three mermaids; three centaurs. Browning gives the impression of being as detailed and ardent a nature-lover as Pippa, and as far-ranging in his mythology of that field as Pliny - yet how much of this effect is obtained by his judicious employment of twenty-five dragons, seven basilisks and five phoenixes? And

Tennyson, wind-swept in his Wordsworthian cloak, was not far behind, with his twenty-four dragons and ten mermaids. Shakespeare himself had only eighteen dragons.....

Along with the trend towards personal interpretation, and the diminution of the number of fables retained, there has been noticeable since 1800 an increasing nostalgia in the use of pseudodoxia. As the old tales recede farther from belief, they seem to gather around them the whole wistful aura of the golden age to which their dream-animals would seem to have belonged. They came even to represent that age and wonder of the world. Wrote Wordsworth:

.....Great God! I'd rather be
A Pagan suckled in a creed outworn;
So might I, standing on this pleasant lea,
Have glimpses that would make me less forlorn;
Have sight of Proteus rising from the sea;
Or hear old Triton blow his wreathed horn. 1

Wrote Yeats:

When have I last looked on
The round green eyes and the long wavering bodies
Of the dark leopards of the moon?

1. "The World Is Too Much With Us."

aeroplane.....to drop on us a bomb." ¹

Hardy uses the old fire-quenching salamander in "The Convergence of the Twain", concerning the sinking of the Titanic, to make colder the cold sea which transforms those

...Steel chambers, late the pyres
Of her salamandrine fires.....
...to rhythmic tidal lyres.....

The new poets have squeezed from the old stories new juices to colour new pictures, skilfully calling up the old connotations to lend depth and contrast to their otherwise unembroidered poetry.

Eliot's three white leopards, for instance, are as old as England - yet how new they look, when we see them from a new tree! Percy Mackaye conjured up a new mermaid in his little poem, "France":

Half artist and half anchorite,
Part siren and part Socrates,
Her face - alluring and yet recondite -
Smiled through her salons and academies.....

-
1. "On the Future of Poetry." Edith Sitwell makes of Pegasus the wooden horse of a merry-go-round - "Marine" poem number 5. And Josephine Peabody likens the airplane to "The Dragon thing - what should it bring?....." - "Men Have Wings at Last."

Edith Sitwell, paeaning the grace of the Princess, "young as the innocent flowers," of "The Sleeping Beauty", likens her to one of the most fierce and powerful of the traditional beasts, the unicorn, with signally happy effect:

.....in the gloom
 She seems, as she glimmers round the room,
 Like a lovely milk-white unicorn
 In a forestial thicket of thorn.

Surely a long trip even for the fabulously strong creature that Pliny described! But Yeats' unicorn is even less Plinian:

...Monstrous familiar images swim to the mind's
 eyes.....
 Their legs long, delicate and slender, aqua-
 marine their eyes,
 Magical unicorns bear ladies on their backs... 1

But those "cloud-pale unicorns" are no whit further from their source, and certainly no more evocative, than is Yeats' hybrid of "Spiritus Mundi":

.....somewhere in sands of the desert
 A shape with lion body and the head of a man,
 A gaze blank and pitiless as the sun,
 Is moving its slow thighs, while all about it

1. "Meditations in Time of Civil War."

the poem "Ash Wednesday". And what a long way from Leah's mandrakes are those of the modern play Waiting for Godot:

Vladimir:What do we do now?
 Estragon: We wait.
 Vladimir: Yes, but while we wait.
 Estragon: What about hanging ourselves?

Vladimir whispers to Estragon. Estragon highly excited.

Vladimir: With all that follows. Where it falls mandrakes grow. That's why they shrink when you pull them up. Did you not know that?
 Estragon: Let's hang ourselves immediately.

Indeed, modern poetry contains a bewildering profusion of examples illustrating the versatility of use by present writers of the nature fables that have survived the assault of science to come down to them. It has been shown that while most of the old pseudodoxia naturalis perished after 1600, the few picturesque specimens that lived on continue to serve poets faithfully. It remains to speculate on what the future of the fables will be. Yeats, in "The Song of the Happy Shepherd", declared,

.....The woods of Arcady are dead,

And over is their antique joy;
Of old the world on dreaming fed;
Grey Truth is now her painted toy;
Yet still she turns her restless head.....

In the next chapter there will be no such rash thing as a prediction concerning the direction towards which that restless head will turn, nor the nature of the literature upon which it will feed. There will only be an attempt to summarize the present state of the small instrument of literature called nature fable, and a guess concerning its future.

-o-o-

CHAPTER VIII.CONCLUSION

"Do you know," said the little friar, as they wound along the banks of the stream, "the reason why lake-trout is better than river trout, and shyer withal?" "I was not aware of the fact," said Sir Ralph. "A most heterodox remark," said Brother Michael: "know you not, that in all nice matters you should take the implication for absolute, and, without looking into the fact whether, seek only the reason why?"

Peacock, Maid Marian,
Chapter II.

It has been a long journey, this following of the whole course of nature fables. The path has led from mysterious beginnings through classic adornment, Christian moralization and scientific destruction to modern symbolization. The journey has been rambling, and often beset by a welter of detail - particularly in that part of it which dealt with the seventeenth century and the attack of science. Therefore, before proceeding to a consideration of the present state of nature fables in English literature, it might be helpful to set the stage by reviewing the career of the

whole group of nature fables through chronologically arranged quotations from the life of one of them - a typical one - the mermaid. Included with this gentle lady-fish will be less gentle lady-birds and not at all gentle lady-monsters, sweet-singing sirens, and other man-eating members of the ancient family which ultimately fused into our present concept of "mermaid".

INDIA.

Once the life that was to become Buddha took form as a.....Cloud-horse. Now at the south of India is an island off which in olden times many ships were wrecked, and the women.....dressed in their best, used to meet the shipwrecked sailors, give them food and ask them to be their husbands. These women were evil demons, Yakkhinis, and they had the power to call up illusive pictures of prosperous fertile lands and beautiful surroundings, so that the men often went home with them. They did not know that though they would be fêted for a time, when another ship was wrecked the women would put them in dungeons, kill them and eat them while the new sailors took their places. One day some merchants were shipwrecked and as usual went home with the women. In the night the chief Yakkhini.....killed and ate a sailor..... The leader realized that something was wrong..... In the morningthe Cloud-horse was flying from the Himalayas.....to Ceylon, and.....he called out....."Does anyone want to go home?".....

they were delighted..... 1

GREECE.

.....nimble was our ship, and the winde good;
 But suddenly we were becalmed quite.
 Some Daemon sure had laid the Waves asleep.
 Then took we in our Sails, and laid them by,
 And with our Oares in hand provokt the Deep,
 And in a milky path we forward ply.
 Then from a Ball of Wax I pinch a bit,
 Chafe it, and into th' ears of one it put;
 And so to all in order as they sit.
 Which soon was done, the weather being hot.
 Then streight they rise and binde me to the Mast
 At th' arms and feet: the knot behind they tie;
 And then upon their seats themselves they plac'd,
 And row'd till to the Island we were nigh.
 When to the Island we were come so nigh,
 As that a man that hollows may be heard,
 The Sirens knowing when we should come by,
 Had tun'd themselves, and had their Song pre-
 par'd.

Come, come, much prais'd Ulysses, come away,
 The brightest glory of the Greeks come near;
 No mortal man did ever come this way,
 That did not to our Musick lend an ear.
 Delight they found, and wisdom carried hence.
 Stay, stay your good black ship, forbear a while
 To beat the Sea; please and inform your sense.
 Come, disimbark yourselves upon our Isle.
 We know what feats of Arms were done at Troy
 Between the Greeks and Trojans all along.
 We know what's done on th' whole earth every day.
 Come, come a-land, and listen to our Song,
 And this they sung with so much harmony
 And sweetness in their voices, that I fain
 Would have recovered my liberty,
 And to them winkt, to be set loose again.

-
1. "Goblin Town", from Jataka Tales, pp. 88 f.

But 'twould not be. My Mates regard my words,
 And not my winks, and sit still at the Oar.
Eurylochos and Perimede bring Cords,
 And binde me harder than they did before.
 When we had left the Sirens at our backs
 So far as not to hear them any more,
 My fellows from their ears pull out the Wax,
 And me unto my liberty restore..... 1

ROME.

.....But, daughters of Acheloüs, why have
 you the feathers and feet of birds, though
 you still have maidens' features? Is it
 because, when Proserpina was gathering the
 spring flowers, you were among the number
 of her companions, ye Sirens, skilled in
 song? After you had sought in vain for
 her through all the lands, that the sea
 also might know your search, you prayed
 that you might float on beating wings
 above the waves; you found the gods ready,
 and suddenly you saw your limbs covered
 with golden plumage. But, that you might
 not lose your tuneful voices, so soothing
 to the ear, and that rich dower of song,
 maiden features and human voice remained. 2

* * *

.....such a Mermaid was seene.....plainely
and the inhabitants.....heard it a
 farre off when it was dying, to make pite-
 ous mone, crying and chattering very

-
1. Homer's Odyssees (translated by Thomas Hobbes),
 Book XII, pp. 147 f.
 2. Ovid, Metam., V, 11, 552 ff. Acheloüs was a
 river god, overcome by Hercules in a fight for
 Deianira.

heavily. ¹

THE BESTIARY.

The SIRENAE.....as Physiologus says, are deadly creatures who are made like human beings from the head to the navel, while their lower parts down to the feet are winged. They give forth musical songs in a melodious manner, which songs are very lovely, and thus they charm the ears of sailormen and allure them to themselves. They entice the hearing of these poor chaps by a wonderful sweetness of rhythm, and put them to sleep. At last, when they see that the sailors are deeply slumbering, they pounce upon them and tear them to bits.

That's the way in which ignorant and incautious human beings get tricked by pretty voices, when they are charmed by indelicacies, ostentations and pleasures, or when they become licentious with comedies, tragedies and various ditties. They lose their whole mental vigour, as if in a deep sleep, and suddenly the reaving pounce of the Enemy is upon them. 2

HORTUS SANITATIS.

Syrene, the mermayde is a dedely beste that bringeth a man gladly to dethe, from the navyll up she is lyke a woman wth a dredfull face, a longe slymye here a grete body & is lyke the egle in the nether partsshe singeth a maner of swete song and

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1. Pliny, Natural History, I, 236.
 2. White, The Book of Beasts, pp. 134 f.

therwith deceyveth many a gude mariner, for
whan they here it they fall on slepe common-
ly, & than she commeth and tereth them ason-
der.....but ye wyse mariners stoppe their
eares whan they se her.....& than they cast
out an empty tonne to let her play with it
tyll they be past her..... 1

ELIZABETHAN.

.....the whole Fair is the shop of Satan;
they are hooks and baits, very baits, that
are hung out on every side, to catch you,
and to hold you, as it were, by the gills,
and by the nostrils, as the fisher doth;
therefore you must not look nor turn toward
them. - The heathen man could stop his
ears with wax against the harlot of the sea;
do you the like with your fingers against
the bells of the beast. 2

SEVENTEENTH CENTURY.

.....If Diogenes had known of this animal
(manatee) he would not have had to pluck a
fowl in order to ridicule Plato's definition
of man as a featherless biped; for the
Manati is a featherless biped. 3

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1. Hortus Sanitatis, p. 154.
 2. Zeal-of-the-land Busy speaking. Jonson's
Bartholomew Fair, III, 1.
 3. John Ray, Synopsis Methodica Animalium Quadru-
pedum....., p. 194 (translated). The manatee
or sea-cow was presumably one of the origins
of the mermaid - unrecognized as such by
mediaeval English writers.

AUGUSTAN.

.....Others the Syren Sisters warble round,
And empty heads console with empty sound..... 1

ROMANTIC.

...In the blue depth of the waters.....
Where the Mermaid is decking
Her green hair with shells..... 2

MODERN.

.....But, children, at midnight,
When soft the winds blow;
When clear falls the moonlight;
When spring-tides are low.....
We will gaze, from the sand-hills,
At the white, sleeping town;
At the church on the hill-side -
And then come back down.
Singing, 'There dwells a lov'd one,
But cruel is she,
She left lonely for ever
The kings of the sea.' 3

-
1. Pope, "The Dunciad".
 2. Byron, "Manfred", II. 397 f. In "Don Juan", XII, 73, Byron less romantically compares English girls to "virtuous mermaids, whose /Beginnings are fair faces, ends mere fishes...."
 3. Arnold, "The Forsaken Merman". Mermen of course have existed as long as have mermaids. Pliny said that near Lisbon the people once found "a certain sea goblin, called Triton, sounding a shell like a Trumpet or Cornet". - Op. cit. In the Middle Ages they were often called "Mer-knights" and supposed to wear heavy /

* * *

.....Prayer unsaid, and mass unsung,
 Deadman's dirge must still be rung:
 Dingle-dong, the dead-bells sound!
 Mermen chant his dirge around!
 Wash him bloodless, smooth his fair,
 Stretch his limbs, and sleek his hair.....
 In the wormless sand shall he
 Feast for no foul glutton be.....
 Dingle-dong, the dead-bells boom!
 Mermen lay him in his tomb! 1

* * *

...I have heard the mermaids singing, each to
 each.
 I do not think that they will sing to me. 2

It is a pity that space forbids inclusion of more examples of the versatile and often

-
1. George Darley, "The Sea Ritual". Little has been said of the Irish poets other than Yeats in this thesis. The Irish of course have used a great deal of imagery, but usually it has involved their own particular unnatural creatures such as leprechauns, banshees, elves, the shee, and various sub-gods.
 2. Eliot, "Prufrock".
-

3. (contd.)
 heavy armour. In "The Lay of St. Odille" of The Ingoldsby Legends Odille's suitor Count Herman, "A highly respectable man as a Germansmoked like a chimney and drank like a Herman....."

extremely effective use of mermaids by modern writers, but the point must now be made that this review may perhaps be deceptive, by giving the impression that as fared mermaids, so fared all of their equally fabulous cousins of pseudodoxia naturalis. That condition is true only for a small and select company; the other fabulous creatures accompanied the mermaid only as far as the seventeenth century. There they collapsed and vanished into the air that had bred them, leaving only the ghostliest of remains for archaeologically-minded writers to unearth as curiosities and/ or evidence of erudition.

The mermaid belongs to the class of pseudodoxia naturalis still extant today which might be called "Modified". This class includes all fabulous men and animals and plants which have been discredited but which have proved so picturesque that artists have retained them, for symbols. Along with the mermaid the "Modified" group contains the giant, the dragon, the basilisk, the griffin, the unicorn, the phoenix, the vampire, the werewolf, and a pantheon of Hellenic monsters:

centaur, gorgon, hydra, chimera, Pegasus, Minotaur and their relations the satyrs and nymphs and so on. The "Modified" fables are still going strong, and will be discussed later.

Other groups still extant are the "Muddy", the "Mummified", the "Minified" and the "Mixed".

"Muddy" fables are those of clouded possibility, like the attribution of antipathies and sympathies, or human emotions, to lower creatures. Naturalists are slow to make pronouncements concerning these matters. It is certain that the wilder notions, such as are so popular in the wilder sections of the popular press, are false. Beyond that the men of science hesitate to make judgments.

"Mummified" fables are those like the "swan-song" and "halcyon days" which have continued in use but have so shrivelled and dried up that their original meaning has been all but lost. "Swan-song" now merely means one's last performance. "Halcyon days" are not even winter days - they are the blandest days of summer.

"Minified" fables are those which have

fared even worse than the mummified. They have survived only in phrases which have become separated from their original owners. An "unlicked cub", for instance, no longer evokes any image of "bear".

"Mixed" fables are those like the "channering worm", which continues to devour the dead in one section of our minds, but does not exist in another. The average twentieth-century Western man would, if asked "What happens when you are buried?", reply, "The worms eat you." Yet if he were asked to give the matter some thought; to try to imagine the actual process of decomposition in the coffin; in all likelihood he would (with no great delight) outline fairly accurately the wormless progress of decay. He believes in the old worm that dieth not in much the same way as he may believe in certain parts of the Bible - not against reason, but aside from it, by virtue of not placing belief and reason together. Along with the channering worm might be classed other supposed examples of spontaneous generation - although "mixed" belief in this theory does not reach so high in the scale of intelligence as does split

belief in the worm.

These five groups of nature fables still persist, then. The others are gone. And of the five groups that persist, only two are important for modern writers. The "Mummified" fables exist only in isolated phrases which can evoke only single, flashing images. When one sees "crocodile tears" he thinks only "hypocrisy". The "Minified" fables are even less effective for imagery than the "Mummified". And although the "Mixed" are still potent image-begetters, they are few in number. Only the worm, as noted, and perhaps spontaneous generation, and pre-natal influence.

The two powerful groups, on which rest the present hopes for continuance of pseudodoxia naturalis as a major instrument of English literature, are the "Muddy" upon which depend most children's books, and much science fiction, and the "Modified": the mermaid, the dragon, the phoenix and the other old stand-byes which came from the great deep and seem destined to go with man to the other great deep that awaits the real and the unreal alike. These visions, embodied from dreams,

have survived the storm of literal reduction and scientific dispersion, and now have re-assumed something of their original rôle. To modern man, surrounded by a world of gigantic forces, the dragon and the phoenix have come once again to represent indescribable powers. The mermaid sings no mortal song; the unicorn leads to no mortal land. Science killed their bodies, but their spirits, phoenix-like, have risen again. In our present world they are beyond-price possessions of our artists; indeed, like Voltaire's God, if they didn't now exist we would have to invent them. It is impossible to foresee when the need for them as symbols for writers will cease.

To demonstrate how these have outlasted the other fables which were so popular until 1600, a brief listing of the literary use of six of them follows. The six are mermaid, basilisk, dragon, griffin, phoenix, unicorn. Figures are the total number of references to these six imaginary creatures.

Bible 47, Chaucer 15, Spenser 40,
Shakespeare 67, Donne 13, Milton 16, Dryden 11,

Pope 7, Cowper 1, Keats 17, Shelley 9, Byron 19, Burns 1¹, Wordsworth 10, Tennyson 40, Browning 43, Kipling 3, Yeats 15, Joyce 23.

These figures, demonstrating an up-curve after the seventeenth and eighteenth centuries, take on more significance when it is remembered that while such references to these most fabulous of beasts were thus weathering the attack of science, nearly all the other fables were falling by the wayside. As has been remarked, Shakespeare used more than one hundred and fifty different nature fables. Milton used about sixty. Dryden used about forty-five. Pope used thirty. Byron, that notable fighter for lost causes, momentarily revived the dying, and found use for thirty-seven different fables. But Keats slumped off to some thirty, and Shelley, despite his appearance of nature-fantasy, actually referred to less than ten nature fables. Burns used eleven. Kipling used fifteen, and Yeats used eighteen. A modern poet who wishes his allusions understood (which,

1. "Pleasure with her siren air....." "Written in Friars-Carse."

alas, some of them do not) is confined, in the field of unnatural natural history, to about twenty-five items: Amazon, Basilisk, bear, crocodile, dragon, giant, griffin, halcyon, hybrid, mandrake, mermaid, monster, Pegasus, phoenix, porcupine, Romuli, salamander, sea-serpent, unicorn, vampire, werewolf, worm, antipathies and sympathies, metamorphosis, attribution of human powers and emotions to animals and plants, the virgula divina and the power of music to charm. The last five have been made the last five because they are of the "Muddy" class. Included with them could be the less wild varieties of sea-serpent and things like the abominable snowman. Of the others, all except bear, crocodile, swan, halcyon, porcupine and worm belong to the "Modified" group. Unlicked bear cubs and crocodile tears and halcyon days contribute little to the evocative power of a poem; porcupines can not shoot their quills very far these days; the channerring worm cannot leave his grave; Tarzan and Mowgli and even whatever atom-operated-foster-mothered children the future science fictioners dream up must grow out of childhood. None of

these fables can be of more than momentary assistance to a poet. His big guns are the big guns of the past - "Foxy Grandpa" and Peter Rabbit - and dragon, mermaid, phoenix, unicorn; evil, love life, mystery. With perhaps now and then a basilisk to slay the distant foe beyond sword's range, and a griffin or Pegasus to whisk away the victor to the misty concourse of giants, mandrakes and salamanders.

English literature today is going further into - not emerging from - the dragon-haunted land. Not for a long time will our writers lose interest in that dragon's past, or his future. The old myths which were born of wonder and have outlasted man's gullibility, scepticism and sophistication, will surely live to return with him to the fields of wonder. Seventeenth century science destroyed much detailed error in the book of nature, and banished to oblivion a host of minor fables. But it also opened the way for the search for the larger truth, and freed the greater fables from the chains of literalism to help, with their changing shapes, in

that search. Our scientists forever dig deeper into the little friar's "fact whether". (And their digging may unearth new unnatural matter for literary use - who knows what atomic monsters lurk ahead?) Our poets must venture farther and farther in pursuit of the "reason why" - with unicorns to guide them.

fire

Burns, where the dead whisper:
 'I am the God of your fathers,
 Abraham, Isaac, Jacob, Moses.....'
 'What are you doing here?' 'Where
 Is the Lord God of Elijah?
 The bull god, the bull roarer
 Gold from the gold, or the child
 Christ in his cave, where Mary
 Sang by the fire to her baby?'
 The bush crackled, burning:
 'I am. I have called my son.'
 'Shall I call my people back again?'
 Here in the common ground, the common stem
 Of Israel, Christendom, Islam,
 The bush burns and the Phoenix
 Sings. Can you hear
 Christ crying by the fire? 1

-o-o-

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1. "Advent on Sinai", unpublished, by Brother George Every, S.S.M.

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